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HOMOLOGY AND ITS EVOLUTIONARY INTERPRETATION¹

The recent revival of interest in the problem of evolution seems to have called forth two very opposite expressions of opinion from those who profess to represent Catholic thought on this subject. M. Henry de Dorlodot, in his "Le Darwinisme," appears in the rôle of an ardent admirer of Darwin and an enthusiastic advocate of the doctrine of Transformism. The contrary attitude is adopted by Mr. Alfred McCann, whose "God—or Gorilla" is bitterly antagonistic not only to Darwinism but to any form whatever of the theory of Transformism. Both of these works possess merits which it would be unjust to overlook. Dorlodot deserves credit for having shown conclusively that there is absolutely nothing in the Scriptures, or in Patristic tradition, or in Catholic theology, or in the philosophy of the Schools, which conflicts with our acceptance of organic evolution as an hypothesis explanatory of certain biological facts. In like manner, it must be acknowledged that, even after a liberal discount has been made in penalty of its bias and scientific inaccuracy, Mr. McCann's book still contains a formidable residue of serious objections, which the friends of evolution will probably find it more convenient to sidestep than to answer.

Unfortunately, however, neither of these writers maintains that balanced mental poise which one likes to see in the defenders of Catholic truth. Dorlodot seems too profoundly

¹ The second of a series of articles on the present status of the theory of evolution in the light of Catholic thought. The first article appeared in the January (1923) issue.

impressed with the desirability of occupying a popular position to do impartial justice to the problem at issue, and his anxiety to keep in step with the majority blinds him apparently to the flaws of that "Darwinism" which he praises. Had he been content with a simple demarcation of *negative limits*, there would be no ground for complaint. But, when he goes so far as to bestow unmerited praise upon the author of the *mechanistic* "Origin of Species" and the *materialistic* "Descent of Man"; when, by confounding Darwinism with evolution, he consents to that historical injustice which allows Darwin to play Jacob to Lamarck's Esau, and which leaves the original genius of Mendel in obscurity while it accords the limelight of fame to the unoriginal expounder of a borrowed conception; when, by means of the sophistry of anachronism, he speciously endeavors to bring the speculations of an Augustine or an Aquinas into alignment with those of the ex-divinity student of Cambridge; when he assumes that Permanence is so evidently wrong that its claims are unworthy of consideration, whereas Transformism is so evidently right that we can dispense with the formality of examining its credentials; when, in a word, he expresses himself not merely in the sense, but in the very stereotyped cant-phrases, of a dead philosophy, we realize, with regret, that his conclusions are based, not on a reasoned analysis of the evidence, but solely upon the dogmatism of scientific orthodoxy, that his thought is cast in antiquated molds, and that for him, apparently, the sixty-four years of discovery and disillusionment, which have transpired since the publication of the "Origin of Species," have passed in vain.

But, if Dorlodot represents the extreme of uncritical approval, Mr. McCann represents the opposite, and no less reprehensible, extreme of biased antagonism, that is neither fair in method nor conciliatory in tone. Instead of adhering to the time-honored practice of Catholic controversialists, which is rather to overstate than to understate the argument of an adversary, Mr. McCann tends, at times, to minimize, in his restatement, the force of an opponent's reasoning. He frequently belittles with mere flippant sneer, and is only too ready to question the good faith of those who do not share his con-

victions. Thus, when McCann ridicules Wells and accuses him of pure romancing, because the latter speaks of certain *hairy* "wild women" of the Caves, he himself seems to be ignorant of the fact that a palaeolithic etching has been found representing a woman so covered with hair that she had no need of other apparel (the bas relief from Laugerie-Basse carved on reindeer palm—cf. *Smithson. Inst. Rpt. for 1909*, p. 540 and Plate 2).

Mr. McCann may object, with truth, that this is far from being a proof that the primitive representatives of the human race were hairy individuals, but the fact suffices, at least, to acquit Mr. Wells of the charge of unscrupulous invention. Hence, while we have no wish to excuse the lamentable lack of scientific conscientiousness so manifestly apparent in the writings of popularizers of evolution, like Wells, Osborne and Haeckel, nevertheless, common justice, not to speak of charity, constrains us to presume that, occasionally at least, their departures from the norm of objective fact were due to ordinary human fallibility or to the mental blindness induced by pre-conceptions, rather than to any deliberate intent to deceive. And we feel ourselves impelled to make this allowance for unconscious inaccuracy all the more readily that we are confronted with the necessity of extending the selfsame indulgence to Mr. McCann himself. Thus we find that the seventh illustration in "God—or Gorilla" (opposite p. 56) bears the legend: "Skeletons of man and *chimpanzee* compared," when, in point of fact, the ape skeleton in question is not that of a chimpanzee (*Troglodytes niger*) at all, but of an Orang-utan (*Simia satyrus*), as the reader may verify for himself by consulting Plate VI of the English version of Wasmann's "Modern Biology," where the identical illustration appears above its proper title: "Skeleton of an adult *Orang-utang*." Since the error is repeated in the index of illustrations and in the legend of the third illustration of the appendix, it is impossible, in this instance, to shift the responsibility from Mr. McCann to the printer. At any rate, it is sincerely to be hoped that this, and several other infelicitous errors will be rectified in the next edition of "God—or Gorilla."

In a future article, we hope to have the opportunity of criticizing in greater detail the above-mentioned books of

Dordolot and McCann. For the present, the former work need not concern us, while in the latter we shall single out but one point as being germane to our subject, namely, Mr. McCann's inadequate rebuttal of the evolutionary argument from *homology*. The futility of his method, which consists in matching insignificant differences against preponderant resemblances, and in exclaiming with ironic incredulity: "Note extraordinary resemblances!" becomes painfully evident, so soon as proper presentation enables us to appreciate the true force of the argument he is striving to refute. *Functionally* the foot of a Troglodyte ape may be a "*hand*," but *structurally* it is the homologue of the human *foot*, and not of the human hand; nor is this homology effectually disposed of by stressing the dissimilarity of the *hallux*, whilst one remains discreetly reticent concerning the similarity of the *calcaneum*. For two reasons, therefore, the irrelevance of Mr. McCann's reply is of special interest here: (1) because it illustrates concretely the danger of rendering a refutation inconsequential and inept by failing to plumb the full depth of the difficulty one is seeking to solve; (2) because it shows that it is vain to attempt to remove man's body from the scope of this argument by citing the inconsiderable structural differences which distinguish him from the ape, so that, unless the argument from homology proves upon closer scrutiny to be *inherently inconclusive*, its *applicability* to the human body is a forgone conclusion, and implies with irresistible logic the common ancestry of men and apes.

Such are the reflections suggested by the meager measure of justice which Mr. McCann accords to the strongest zoological evidence in favor of evolution, and they contain in germ a feasible program for the present article, which, accordingly, will address itself: First, to the task of ascertaining the true significance of homology in the abstract as well as the full extent of its application in the concrete; second, to that of determining with critical precision its intrinsic value as an argument for the theory of transmutation.

Homology is a technical term used by the systematists of botany, zoology and comparative anatomy to signify *basic structural similarity* as distinguished from *superficial func-*

tional similarity, which is termed *analogy*. Organisms are said to exemplify the phenomenon of homology when, beneath a certain amount of *external diversity*, they possess in common a group of *internal resemblances* of such a nature that each and every one of them appears to be constructed upon the *same fundamental plan*. In cases of this kind, the basic similarity is frequently masked by a veneer of unlikeness, and it is only below this shallow surface of divergence that we find evidences of the identical structure or common type.

Thus organs of different animals are said to be *homologous* when they are composed of like parts arranged in similar relations to one another. Homologous organs correspond bone for bone and tissue for tissue, so that each component of the one finds its respective counterpart in the other. The organs in question may be functionally specialized and externally differentiated for quite different purposes, but the superficial diversity serves only to emphasize, by contrast, the underlying identity of structure which persists intact beneath it. Thus, for example, the wing of a pigeon, the flipper of a whale, the foreleg of a cat and the arm of a man are organs differing widely in function as well as outward appearance, but they are called homologous, none the less, because they all exhibit the same basic plan, being composed of similar bones similarly disposed with respect to one another.

Organs, on the other hand, are called *analogous* which, though *fundamentally unlike in structure*, are, nevertheless, *superficially* modified and specialized for *one and the same function*. The wing of a bird and the wing of an insect furnish a trite instance of such *analogy*. Functionally they subserve the same purpose, but structurally they bear no relation to each other. In like manner, though both are devoted to the same function, there exists between the leg of a man and the leg of a spider a fundamental disparity in structure.

At times, specialization for the selfsame function involves the emergence of a similar *modification* or *uniform structural adaptation* from a substrate of basic dissimilarity. In these instances of parallel modifications appearing on the surface of divergent types, we have something more than mere functional resemblance. Structure is likewise involved, albeit

superficially, in the modification which brings about this external uniformity. In such cases, *analogy* is spoken of as *convergence*, a phenomenon of which the mole and the mole-cricket constitute a typical example. The burrowing legs of the insect are, so far as outward appearance goes, the exact replica on a smaller scale of those of the mole, though, fundamentally, their structure is quite unlike, the mole being built on the *endoskeletal* plan of the *vertebrates*, whereas the mole-cricket is constructed on the *exoskeletal* plan characteristic of the *arthropods*. Speaking of the first pair of legs of the mole-cricket, Thomas Hunt Morgan says: "By their use the mole-cricket makes a burrow near the surface of the ground, similar to, but of course much smaller than, that made by the mole. In both of these cases the adaptation is the more obvious, because, while the leg of the mole is formed on the same general plan as that of other vertebrates, and the leg of the mole-cricket has the same fundamental structure as that of other insects, yet in both cases the details of structure and the general proportions have been so altered that the leg is fitted for entirely different purposes from those to which the legs of other vertebrates and other insects are put" (quoted by Dwight in "Thoughts of a Catholic Anatomist," p. 235). In the *analogies of convergence*, therefore, we have precisely the reverse of the phenomenon so often encountered in connection with *homology*. The latter exhibits a contrast between basic identity and superficial diversity, the former a contrast between superficial convergence and fundamental divergence.

Now the extreme importance of homology is manifest from the fact that the taxonomists of zoology and botany have found it to be the most satisfactory basis for a scientific classification of animals and plants. In both of these sciences, organisms are arranged in groups according as they possess in common certain points of resemblance whereby they may be referred to this, or that, general type. The resemblance is most complete between members of the same *species*, which do not differ from one another by any *major difference*, though they may exhibit certain *minor differences* justifying their subdivision into *varieties* or *races*. These *morphological* considerations, however, must, in the case of an *organic species*, be

supplemented by the additional *physiological* criterion of perfect *sexual compatibility* and complete *interfertility*, as we have already had occasion to note in a previous article. When organisms, though distinguished from one another by some major difference, agree, notwithstanding, in the main elements of structure, the several species to which they belong are grouped under a *common genus*, and similarly genera are grouped into *families*. A *relative* major difference, such as a difference in the *size* of the teeth, suffices for the segregation of a *new species*, while an *absolute* difference, such as a difference in the *number* of teeth or the possession of an *additional organ*, suffices for the segregation of a *new genus*. In practice, however, the classifications of systematists are often very *arbitrary*, and we find them divided into two factions, the "lumpers" who wish to reduce the number of systematic groups and the "splitters" who have a passion for breaking up larger groups into smaller ones on the basis of tenuous differences. Above the *families* are the *orders*, and they, in turn, are assembled in still larger groups called *classes*, until finally we reach the *phyla* or *branches*, which are the supreme categories into which the plant and animal kingdoms are divided. As we ascend the scale of classification, the points of resemblance between the organisms classified are constantly decreasing in number, while the points of difference increase apace. Hence, whereas members of the same species have very much in common, members of the same phylum have very little in common, and members of different phyla show such structural disparity that further correlation on the basis of similarities becomes impossible (in the sense, at least, of a reliable and consistent scheme of classification), all efforts to relate the *primary phyla* to one another in a satisfactory manner having proved abortive.

Within the confines of each phylum, however, *homology* is the ground-principle of classification. But the scientist is not content to note the bare fact of its existence. He seeks an explanation, he wishes to know the *raison d'être* of homology. Innumerable threads of similarity run through the woof of divergence, and the question arises: How can we account for the coexistence of this woof of diversity with a warp of simi-

larity? Certainly, if called upon to explain the similarity existent between members of one and the same species, even the man-in-the-street would resort instinctively to the principle of *inheritance* and the assumption of *common ancestry*, exclaiming: "Like sire, like son!" It is a notorious fact that children resemble their parents, and since members of the same species are sexually compatible and perfectly interfertile, there is no difficulty whatever in the way of accepting the presumption of descent from common ancestral stock as a satisfactory solution of the problem of *specific resemblance*. Now, it is precisely this selfsame principle of *heredity* which the Transformist invokes to account for *generic*, no less than for *specific*, similarity. In fact, he presses it further still, and professes to see therein the explanation of the resemblances observed between members of the different *families*, *orders* and *classes*, which systematists group *under a common phylum*. This, of course, amounts to a bold extension of the principle of inheritance far beyond the barriers of *interspecific sterility* to remote applications that exceed all possibility of *experimental verification*. Transformists answer this difficulty, however, by contending that the period, during which the human race has existed, has been, geologically speaking, all too brief, and attended with environmental conditions far too uniform, to afford us a favorable opportunity for ascertaining the extreme limits to which the genetic process may extend; and, even apart from this consideration, they say, organic evolution (phylogeny) may be, like embryological development (ontogeny), an *irreversible process*, in which case no recurrence whatever of its past phenomena are to be expected in our times.

Be that as it may, the evolutionist interprets the resemblances of homology as surviving vestiges of an ancient ancestral type, which have managed to persist in the descendants notwithstanding the transformations wrought in the latter by the process of progressive divergence. Moreover, just as the existence of a common ancestor is inferred from the *fact* of resemblance, so the relative position in time of the common ancestor is inferred from the *degree* of resemblance. The common ancestor of forms closely-allied is assumed to have been *proximate*, that of forms distantly-resembling each other is thought to have been *remote*. Thus the common ancestor of

species grouped under the same genus is supposed to have been less remote than the common ancestor of all the genera grouped under one family. The same reasoning is applied, *mutatis mutandis*, to the ancestry of families, orders and classes.

The logic of such inferences may be questioned, but there is no blinking the fact that, in practice, the genetic explanation of homology is assumed by scientists to be the only reasonable one possible. In fact, so strong is their confidence in the necessity of admitting a solution of this kind, that they do not hesitate to make it part and parcel of the definition of homology itself. For instance, on page 130 of Woodruff's "Foundations of Biology" (1922), we are informed that homology signifies "a fundamental similarity of structure based on descent from a common antecedent form." The Yale professor, however, has been outdone in this respect by Prof. Calkins of Columbia, who discards the anatomical definition altogether and substitutes, in lieu thereof, its evolutionary interpretation. "When organs have the same ancestry," he says, "that is, when they come from some common part of an ancestral type, they are said to be *homologous*" (*Biology*, p. 165). In short, F. A. Bathers is using a consecrated formula culled from the modern biological creed when he says: "The old form of diagnosis was *per genus et differentiam*. The new form is *per proavum et modificationem*" (*Science*, Sept. 17, 1920, p. 259).

A moment's reflection, however, will make it clear that, in thus confounding the definition proper with its theoretical interpretation, the modern biologist is guilty of a logical atrocity. *Homology*, after all, is a simple anatomical fact, which can be quite adequately defined in terms of observation; nor is the definition improved in the least by having its factual elements diluted with explanatory theory. On the contrary, the definition is decidedly weakened by such redundancy. And as for those who insist on defining *homology* in terms of *atavistic assumption* instead of *structural affinity*, their procedure is tantamount to defining the clear by means of the obscure, an actual effect by means of a possible cause. Moreover, this attempt to load the dice in favor of Transformism by tampering with the definition of homology ends by defeating its own purpose. For, if homology is to serve as a legitimate argument for evolution, then obviously *evolution must not be*

included in its definition; otherwise, the conclusion is anticipated in the premise, the question is begged, and the argument itself rendered a *vicious circle*.

Having formed a sufficiently clear conception of *homology* as a *static fact*, we are now in a position to consider the problem of its *causality* with reference to the solution proposed by evolutionists. *Transmutation*, they tell us, results from the interaction of a twofold process, namely, the *conservative* and *similifying* process called *inheritance*, and *progressive* and *diversifying* process known as *divergence* or *variation*. Inheritance by transmitting an ancestral likeness tends to bring about *uniformity*. Variation by diverting old currents into new channels adjusts organisms to new situations and brings about *modification*. *Homology*, therefore, is the effect of *inheritance*, while *adaptedness* or *modification* is the product of *variation*.

As here used, the term *inheritance* denotes something more than a mere *recurrence of parental characters in the offspring*. It signifies a process of *actual transmission* from generation to generation. Strictly speaking, it is not *characters*, such as coloration, shape, size, chemical composition, structural type and functional specificity, that are "inherited," but rather the *hereditary factors* or *chromosomal genes*, which alone are *transmitted*, and of which the *characters* are but the external expression and manifestation. Hence, it is scarcely accurate to speak of "inherited," as distinguished from "acquired," characters. As a matter of fact, all *somatic characters* are a *joint product* of the interaction of the *germinal*, and the *environmental*, factors. Consequently, the external *character* would be affected no less by a change in the environmental characters than by a change in the germinal factors. In a word, somatic characters are not the exclusive expression of the genetic factors, but are equally dependent upon environmental influence, and hence it is only to the extent that these characters are *symptomatic* of the *specific constitution* of the *germ plasm* that we may speak of them as "inherited," remembering that what is *really transmitted* are the *genes* or *germinal factors* and not the *characters* themselves. The sense is, therefore, that "inherited" characters are manifestative of what is contained in the germ plasm, while "acquired" char-

acters have no specific germinal basis but are a resultant of the interaction between the somatic cells and the environment. In modern terminology, the aggregate of germinal factors transmitted in the process of reproduction is called the *genotype*, while the aggregate of somatic characters which manifest these germinal factors externally is spoken of as the *phenotype*. Only the *genotype* is transmitted, the *phenotype* being the subsequent product of the interplay of genetic factors and environmental stimuli, dependent upon, and expressive of, both.

Divergence, or *variation*, therefore, may be based upon a change in the *germ plasm*, or in the *environment*, or in both. If it rests *exclusively* upon an *extraordinary* change in the *environmental* conditions, the resulting *modification* is *non-inheritable*, and will disappear so soon as the exceptional environmental stimulus that evoked it is withdrawn. If, on the contrary, it is based upon a *germinal change*, it will manifest itself, *even under ordinary unchanged and uniform environmental influence*. In this case, the *modification* is *inheritable* in the sense that it is the specific effect of a transmissible germinal factor, which has undergone alteration.

As we have seen in a previous article, there are three kinds of germinal change which result in "*inheritable*" *modifications*. The first is called *factorial mutation*, and is initiated by an *alteration* occurring in one or more of the *chromosomal genes*. The second is called *tetraploidy* or *chromosomal mutation*, and is caused by *duplication* of the *chromosomes*. The third may be termed *recombination*, one type of which results, from the *cross-over* or exchange of genes between pairing chromosomes ("*pseudo-mutation*"), the other from *random assortment* in accordance with the Mendelian law of the independence of allelomorphous pairs. This so-called "random assortment of the chromosomes" is the result of the *shuffling* and *free deals* of the chromosomal cards of heredity which takes place *twice* in the life-cycle of organisms: viz., first, in the process of reduction (meiosis); second, in the chance meeting of variously constituted sperms and eggs in fertilization. A mischance of the first of these "free deals" is bewailed in the following snatch from a parody belonging to the Woods Hole anthology.

"Oh chromosomes, my chromosomes,
How sad is my condition!
My grandsire's gift for writing well
Has gone to some lost polar cell,
And so I write this doggerel,
I cannot do much better."

These kinds of variation, however, in so far as they fall within the range of actual observation, are confined within the limits of the organic species. *Intraspecific* divergence, however, will not suffice. To account for the *adaptive modifications* superimposed upon underlying structural identity, Transformism is obliged to assume the possibility of *trans-specific* variation. Yet in none of the foregoing processes of variation do we find a valid factual basis for this assumption.

Factorial mutation, for instance, waiving its failure to produce naturally-viable forms, or to meet the physiological fertility-test of a new species, admits of interpretation as a change of *loss* due to the "dropping-out" of a *gene* from the germinal complex. Bateson's conception of evolution as a process consisting in the *gradual loss of inhibitive genes*, whose elimination releases suppressed potentialities, seems rather incredible. Many will be inclined to see in Castle's facetious epigram a *reductio ad absurdum* of Bateson's suggestion; for, in that case, as the Harvard professor remarks, we shall have to *regard man as a simplified amoeba*. Certainly, it seems nothing short of a contradiction to ascribe the *progressive complication of the phenotype* to the *simplification of the genotype by loss*.

On the other hand, not only is there no experimental evidence for a germinal change by *positive acquisition*, that is, by the *addition of genes*, but it is hard to conceive how such a change could have come about. "At first," admits Bateson, "it may seem rank absurdity to suppose that the primordial form or forms of protoplasm could have contained complexity enough to produce the divers types of life." "But," he asks, "is it easier to imagine that these powers could have been conveyed by extrinsic addition? Of what nature could these additions be? Additions of material can not surely be in question. We are told that salts of iron in the soil may turn a pink hydrangea blue. The iron cannot be passed on to the

next generation. How can iron multiply itself? The power to assimilate iron is all that can be transmitted. A disease-producing organism like the pebrine of silkworms can in a very few cases be passed on through the germ cells. But it does not become part of the invaded host, and we can not conceive it taking part in the geometrically ordered processes of segregation. These illustrations may seem too gross; but what refinement will meet the requirements of the problem, that the thing introduced must be, as the living organism itself is, capable of multiplication and of subordinating itself in a definite system of segregation?" (*Heredity*, Smithsonian Inst. Rpt. for 1915, p. 373.)

Nor can we agree with Prof. T. H. Morgan's contention that the foregoing difficulty of Bateson has been solved by the discovery of the *chromosomal mutation*. It is true that cases of *tetraploidy* and *triploidy* have been observed to arise in normal *diploid* races, but, in the instances where they have arisen under direct observation as distinguished from inference, these *chromosomal mutants* are *subnormal* in their *viability* and *fertility*. Moreover, *tetraploidy* does not multiply the genes *qualitatively*, but only *numerically*, and the sole effect of this doubling of the genes is a *mere reinforcement of their former effect* resulting in *giantism*. Even this giantism is not a *specific* effect since instances of *giant* and *normal* races possessing both the same *diploid* number of chromosomes are of common occurrence. Morgan himself recognized that mere repetition of identical genes is insufficient, and that their multiplication must be qualitative as well as numerical to meet the demands of the problem. Hence, he assumes that the *chromosomal mutation* is supplemented by subsequent *factorial mutation*. With this supposition, however, all the objections which we have stated in connection with *factorial mutation* return to plague the speculator, and in addition to these, he is confronted with the new difficulty of explaining how the *redundance of duplicate genes* can be removed and replaced by *coordinate differentiation* in their respective specificities. Now we have no factual evidence whatever of such a coordinated change modifying harmoniously the rôle and composition of each and every gene in a germinal complex, nor is there any possibility of accounting for this superregulation of the

germinal regulators upon a purely mechanistic basis. Hence, although it is true that there is no *gametic compatibility* between *diploid* races and the *tetraploid* forms which are said to have arisen from them, nevertheless, that which has been actually verified in the experimental sense does not warrant our acceptance of the *chromosomal mutant* as a *bona fide* "new species."

To conclude, therefore, we have experimental verification of the efficacy of the similifying process said to have been at work in evolution, namely, *inheritance*. The same, however, cannot be said of the correlative diversifying process of *trans-specific variation*, which is said to have superficially modified old structures into new species. The latter process, accordingly, is but a pure postulate of science known to us only through the effect hypothetically assigned to it, namely the *adaptive modification*.

The *adaptation*, however, of which there is question here is not to be confounded with the "acquired adaptation" of Lamarckian fame; for, unlike the latter, it is an *inheritable modification* rooted in the germ plasm. Adaptations of this sort do, indeed, adjust the organism to its external environment, but they are *innate* and not *acquired*. Hence they are often spoken of as *preadaptations*; for they precede, in a sense, the organisms' contact with the environing element to which they adjust it. They may possibly, it is true, have been acquired in the distant past, but they have now a specific germinal foundation, and no one was ever privileged to witness their initial production *de novo*. The whale, for example, though *fundamentally* a warm-blooded *mammal*, is *superficially* a fish, by reason of such a *preadaptation* to its marine environment. Preadaptation is of common occurrence, especially among parasites and inquilines. Wasmann cites innumerable instances of beetles and flies so profoundly modified, in accommodation to their mode of life as guests in termite nests, that the systematist hesitates to classify them under any of the accepted *orders* of insects. Here the adaptive modification so disturbs the underlying homology as to make of these creatures taxonomical ambiguities. In the case of *Termitomyia*, he tells us, "the whole development of the individual has been so modified that it resembles that of a vivipa-

rous mammal rather than that of a fly" ("The Problem of Evolution," pp. 14, 15).

Such modifications, however, amount to *major*, and not merely *minor*, differences. We are not dealing, therefore, with *varietal* distinctions here, but with *specific*, *generic*, and *family*, differences. With reference to the phenomenon of *adaptative modification*, three things, consequently, are worthy of note: (1) it is seemingly *accessory* and *posterior* to the underlying structural uniformity; (2) it is of such magnitude that it cannot be ascribed to variation *within the species*; (3) it has been *appropriated by the hereditary process* in the sense that it is now an "inherited" character based on the transmission of specific germinal factors.

Now it claimed that for the occurrence of this kind of modification in conjunction with homology only one rational explanation is possible, and that explanation is *evolution*. If this contention be a sound one, and Dorlodot, who claims *certitude* for the evolutionary solution, insists that it is such, then, in the name of sheer logical consistency, but one course lies open to us. We cannot stop at Wasmann's comma, we must press on to the very end of the evolutionary sentence and sing with the choristers of Woods Hole:

"It's a long way from Amphioxus,
It's a long way to us;
It's a long way from Amphioxus
To the meanest human cuss.
Good-bye fins and gill-slits;
Welcome skin and hair.
It's a long way from Amphioxus,
But we came from there."

In this predicament it will not do, as we shall see presently, to adopt Mr. McCann's expedient of balancing anatomical differences against anatomical resemblances. To do so is to court certain and ignominious defeat. We must, therefore, examine the argument dispassionately. If it be solid, we must accept it and give it general application. If it be unsound, we must detect its flaws and expose them. Intellectual honesty allows us no alternative!

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(To be continued)

A HIGH SCHOOL LESSON IN THE ART OF LITERATURE

THE METHOD

The dry bones in the cold print of this lesson are to be galvanized into life by a teacher in constant touch with the class and enlisting their cooperation by questions, by having the passage read aloud, by writing on the board, by interchanges of ideas, by lively disputes between individuals. No mere lecture with passive listeners, no mere study period with a passive overseer, but real teaching, which is a fine conversation, directed upon select subjects and carried to a destined end under expert guidance.

All of the technical terms, apprehension, judgment, inference and the rest are to be omitted. The intelligent use of such terms belongs to college, although the operations and objects which the terms designate belong to all grades. Through simple, untechnical questions the whole truth may be understood by each, and every student may be made to go through operations which are of daily occurrence and which the student must make habitual by repeated exercise to insure a mastery of the art of expression. The teacher is an expert mental director, and, setting before the class a good passage of literature, he will make them think again and put in order again and express again what the author has done; he will make them conceive, arrange and express thoughts of their own with the excellence which teacher and class have noted and appreciated in the passage. The teacher of literature will be no lecturer in history or in philosophy or in mathematics, but will be like the teacher of music or like the physical trainer, who makes his class go through exercises which he himself has exemplified and which the class immediately practice to acquire bodily skill then and for the future.

A passage of poetry is designedly taken in this lesson to show how poetry can be made to contribute to the art of expression. Literature for some is history, for others philosophy. These center attention on the facts or ideas. Literature for others is a dreamy, mysterious thing, which you must

look at with awe, speak about with esoteric rhapsody and carefully lock up again in a glass case. A forward looking lesson in literature must know what the passage means, but is usually not concerned with the origin and past history of the author's meaning. The forward looking lesson will not pretend to solve all the mysteries of art and beauty but will take out of the clouds and put clearly before the class some point in the art of expression, a point which will be practical and of every day use. Such a lesson will be as decidedly vocational as hammering a nail or rigging up a radio set or rushing around a gymnasium.

The purpose ever before the literature teacher's mind is appreciation, leading to mental action and through repeated action to the art of expression.

THE LESSON

The curfew tolls the knell of parting day,
The lowing herd wind slowly o'er the lea,
The ploughman homeward plods his weary way,
And leaves the world to darkness and to me.

I. ANALYSIS OF THOUGHT

1. *Understanding*.—The meaning of each word, the meaning of each line, the meaning of the whole stanza. This should not be a mere passive understanding. Students should be made to re-express the ideas, not only by paraphrase in other words but especially by *imaginative realization*. "For instance," "Just like what?" are two phrases to be often on the teacher's lips. "Have you heard a curfew?" "Have you heard a knell tolling?" "Did you ever see in picture or in reality a lowing herd winding o'er the lea?" A thought illustrated by the thinker's imagination is realized fully, is felt as well as grasped, and will persist.

2. *Judgment*.—What is the logical subject and logical predicate of each line and of the whole stanza? That is, what is the author's chief topic and what does he say about it? This need not always be the grammatical subject of the passage. The art of expression is not only apprehending by vivid understanding, but it is also judging by predication, by affirming or denying something of the subject. There is not a class of

any grade which cannot profitably exercise itself in clear and concise judgments. The successive judgments briefly put are: The bell tells the end of day: the cows return to the barn: the ploughman comes home: I am left alone in the darkness.

3. *Reasoning*.—As a single sentence may be analyzed into a definite subject and a definite predicate for a judgment, so two or more sentences may be compared to grasp the relation between them. Poetry does not go through a process of reasoning. It states thoughts and presents pictures, permitting the mind to infer. The three pictures in the opening lines have a common trait which the mind detects: all three pictures are signs of nightfall. The mind draws an inference which is inductive in nature, and the whole stanza may be briefly stated: The coming of night leaves me alone in darkness.

These stages in analyzing the thought are elaborated here. In practice they may be expedited. Before being read, the judgment and inference may be presented as problems for solution: What does the writer say in each line? What one idea is found in the first three lines? What will be the title, the head-line, the summary of each line and of the whole stanza? (For Analysis of Thought see *Model English*, Bk II, Chap. 10.)

II. ANALYSIS OF FORM

Form includes not only the words and sentences, their choice and their arrangement, but also the texture and color of the thoughts and their modification ending in their perfect expression, as contrasted with the bare and limited statements already determined. In the study of literature, words are not merely materials for philologizing, or merely sentences, free opportunities for grammatical anatomizing with all the bones properly numbered and labeled. Such analyses look chiefly backward and are not productive of writers. Language anatomy has its great utility, but literature, or the art of expression, must look to the flesh and blood of the thoughts, to the personality, to the imagination, to the concrete embodiment of the writer's art. The student will take up, therefore, the thought already analyzed and note and appreciate how his

author has clothed the ideas, the judgments, the reasoning. He will re-enact the creative process the author went through, and so here, with a view to expression, he will strive to rival the excellence of Gray, but will do so with his own thoughts.

Grading.—At this stage the teacher may point out incidentally many excellences in the art of expression, but will drill and have practice on the particular excellence in expression, proper to his class. The textbook ordinarily determines the grade, but if there is no textbook or prescribed program, the teacher will determine his own order of matter.

Right Word.—Let us suppose the teacher is teaching the art of using the right word (*Model English*, 3), the word which states the thing exactly in kind. He may center attention on the line:

The lowing herd wind slowly o'er the lea.

The class will be drilled in the author's choice of the right word by considering other possible but less exact combinations, e. g.: A number of noisy cows went reluctantly along. After this drill, the class will appreciate what the right word is and be ready for the expression of their own ideas in right words. They are not to paraphrase Gray's meaning. That has already been done, but they are to provide subject-matter of their own and express it with a like excellence. Did they continue to speak of cows, they could not better Gray, but if they speak of bees or bloodhounds or cavalry or autumn leaves or rioters or anything else that has come under their experience in life or in reading, they might approach the exactness of Gray in giving the right word for the sound, for the collection, for the action, for the manner and for the place.

Bees: the buzzing swarm of bees circled thickly about the hive.

Bloodhounds: the baying pack of hounds followed the trail eagerly.

Cavalry: the clattering squadron of cavalry galloped swiftly along the road.

Autumn: the heaps of rustling leaves were swept into every corner by autumn winds.

Rioters: the yelling mob of rioters rushed wildly towards the jail.

Imagination.—Suppose the teacher is giving a lesson in imagination ("Model English," Chap. X). If one of the *General Methods*, say *Reflecting* (No. 69), is to be taught, then the class must vividly picture in their imaginations Gray's stanza. With the help of books on the desk and with a gesture or two the scene and all its characters may be *dramatized*. All this suggestively rather than with exact mimicry, unless there is in question a passage that may be reproduced by the class in a miniature pageant or play. To test whether the class is actually imagining, have them quickly number, one after another, the things they see and hear directly by the words and indirectly suggested by the words. Or test in another way. Let each draw an outline of the frame of a picture and show how they would illustrate any line or the whole stanza, putting numbers on the blank space to locate the details and explaining to the side what the numbers stand for.

Suppose a *particular method, significant part for the whole* (No. 73) be the matter of the lesson, then the whole which is expressed by Gray is "evening," or "parting day," pictured by three significant details—curfew, cows and ploughman. Have the class take an opposite situation—not evening in a graveyard in preparation for gloomy thoughts, but morning on the farm, looking to a busy, joyous day. Or again, what significant details will suggest the hush of evening in a city or on the sea; noon in a factory, closing of school in the afternoon, coming of winter in December, dawning of spring in April, etc. Interest may be accentuated if one student gives the details and others imagine what is the whole suggested. For example: The cock crows a greeting to the rising sun; the team of horses is hitched to the mowing machine, and soon the clicking knives lay low the waving grass (farm); the crank is whirled about with a swift revolution and jerking stop; the low purr of a hidden engine steals upon the ear and a cloud of dust swallows up the rattling car (a Ford); a sprig of shamrock graces the lapel of the coat; green ribbons flaunt gayly above ruddy cheeks, and down the street steps a band jiggling Garryowen (St. Patrick's Day). In the same way elements of force or interest, metrical charm or poetic

thought and many other points could be taught from this stanza, according to the grade of the class before the teacher. Whatever the passage taken, once the grade has been settled, the artistic drill should be carried through the stages of grasping the thought definitely, of appreciating it with discrimination, of repeating the process of creation, of dramatizing the complete product, and finally of self-expression on the part of the student, striving to rival the author in the excellence he has studied.

FRANCIS P. DONNELLY, S.J.

CO-EDUCATION IN CATHOLIC HIGH SCHOOLS

Catholic high schools, as a distinct institution in the American Catholic school system, are just beginning to develop. Like their pupils, they are entering the adolescent period. Elementary schools, under the impetus of the bishops, and colleges, under the impetus of the religious orders, are already well advanced. Now comes the day for the high school to attain its full growth. Cities of some size will be asking themselves the question, which a few have already asked and answered: "Is it not time for us to establish central Catholic high schools?" and with this question, another will call for an answer: "What about co-education in our high schools?"

We have it, of course, already existing as a condition. It is found in nearly all parish high schools, and also in some central high schools. Its existence is due, not to a policy, but to the exigencies of the situation. Small schools cannot afford duplication of teachers and duplication of expensive equipment for small classes; hence boys and girls are put into classes together. The question is: Is this a condition that is undesirable in itself and to be tolerated only as a necessity? Are we to look forward to the day when it can be dispensed with, or, on the other hand, do we find it not undesirable at all, but actually worthy of being approved as being based on a sound, educational principle?

The question is not about co-education in universities, which is quite a different condition, if only for the reason that the university student is away from home, and therefore under no supervision except what the school provides during the twenty-four hours of the day. The high school student is transferred daily from parent to teacher, and from teacher back to parent; and this in a community where there are friends, relatives, and neighbors of the family. Hence co-education in any high school is under a set of restraining influences which do not exist for the university student. Let us here go a step farther in defining the co-education we want to speak of. It can mean anything from a condition where boys and girls share the same classrooms, study rooms, lunchrooms, corridors,

and playgrounds, to a condition where they merely share the same building. Let us suppose that conditions are between these extremes, being such that the boys and girls meet each other only occasionally, and then under natural and normal circumstances; let us suppose finally that all this exists in a school which possesses every element of what is called Catholic religious atmosphere.

This is not at all an imaginary supposition. I have in mind a school of some 500 students, about equally divided between boys and girls, from the 200 freshmen to the 50 seniors. They attend daily ninety different classes in the aggregate, passing from room to room every forty-five minutes. The classes for freshmen and sophomores are all separate, composed either of boys or girls; it is in the junior and senior years that co-education appears, due to the exigencies of an elective curriculum. Thus about thirty of the ninety daily classes are "mixed." Outside of class the boys and girls pass each other in the corridors, see each other in the library, and may meet on the way to and from school. They have separate lunch-rooms and study rooms, and at present there are no recreation grounds. They are instructed twice a week in religion and assemble for thirty minutes every Friday noon in the chapel. The instructors are seventeen nuns and eight priests, and of course all the students come from Catholic homes. Now, then, we are ready for the question: What is to be thought of co-education observed under these conditions?

Here is the comment of one experienced teacher in this school: "In principle, it is the normal situation, in which the boys and girls will find themselves later in life. In practice, it seems to work at least as well as segregation. The boys and girls here regard each other as fellow-students, quickly acquire an impersonal attitude toward each other, and meet without self-consciousness." The other teachers corroborate this opinion and support it with numerous instances, all of which indicate that boys here pay no more attention to girls than they do to boys, and that girls pay no more attention to boys than they do to girls.

A class of some twenty senior girls were asked if they thought co-education was a source of distractions and a hin-

drance to high scholarship. The composite answer could be framed in these words: "It is about the same as in separate schools." Some thought there was an advantage in the opportunity for competition between boys and girls, or in the support given to athletics and other student activities, but others did not think these advantages were very noticeable. None of the girls would admit that scholarship suffered in a co-educational school. The same question was put to a class of about 25 senior boys, half of whom had formerly been in schools for boys only. Some thought that co-education stimulated rivalry. One ventured the opinion that a boy did not care what other boys thought, but hated to fail before a girl; this statement was greeted with vigorous protests, and with the claim that it depended on the man himself whether he did well or not. All scouted the idea that co-education hindered scholarship. It may not impress educators very much to say that none of the fifty boys and girls consulted expressed any desire for a change; but the truth is that they seemed to take the present condition very much as a matter of course, and to regard with some surprise any connection between scholarship and co-education.

My own observations may be taken for what they are worth: They are what I have called them—simply statements of what could be observed during two years as principal. The observations do not concern the quality of scholarship, except in a negative way—that is, no signs have appeared so far indicating that scholarship is not what it should be or that the instruction given is failing to get good results. At the end of the first semester this year, the number of students who failed in one or two subjects (a few in more) was 102, while the number who made a grade of "A" in from one to four subjects was 143, out of a total enrollment of 524. Scholarship, therefore, giving evidence of being sound enough according to this "curve of distribution," my observations have been directed mainly to conduct, and this for the added reason that there is a strong feeling, especially among people not dealing with it, that co-education in a high school is dangerous.

Nothing at all has occurred at school in these two years that offered any difficulty, and only six or eight cases came up

which needed any attention whatever. Not one of these was public enough to attract any notice from the other students, and therefore to cause anything like scandal. Two of them were cases of note-writing serious enough to require prompt action: one was disciplined, the other settled itself, the two students concerned voluntarily dropping out of school. All the remaining cases were not serious at all, requiring only a momentary admonition about good manners. For example, two or three times girls were observed on the street corner talking to boys; the girls were called in, and the suggestion was made that it was in better taste to hold such conversations in the school. In every case the suggestion seemed to be appreciated. Anyone having dealings with large numbers of young people would agree that six or eight cases like these are not abnormal in any school of 500, whether co-educational or not.

Outside of school we consider that our students are ordinarily under the jurisdiction of their parents, except when they engage in some authorized school activity. In this class of course come dances. Authorizing a dance was begun last year and will be permitted once a year to the senior class. It must be stated that the dance conducted by this year's class was beyond criticism in every respect. Last year there was an informal dance after the Thanksgiving game; and the only difficulty the chaperons found was in overcoming the bashfulness of the boys and persuading them to ask the girls to dance. The teachers have spoken of a similar difficulty, namely, that some of our girls complained that the boys invited girls from other schools to parties but did not invite them. These cases are not cited as virtues; but certainly they do not evidence any undesirable familiarity growing out of co-education. As for the conduct of students while under the jurisdiction of their parents, the first complaint on this score has yet to be received. Parents speak freely about other causes for complaint, but there has been none based on co-education.

It would seem then that co-education in Catholic high schools can exist without giving any evidence of being either a detriment to scholarship or a stumbling-block to virtue. Here arises the question: Adolescent human nature being

what we know it to be, how can we account for this result? It seems to me that we do not give sufficient credit to the accumulated power of all the influences we bring to bear on adolescent human nature. The hours at home, under the eyes of Catholic parents; in the hours at school, under the eyes of priests and nuns; the graces radiating through every parish from pulpit, confessional and tabernacle—all this based on a solid foundation of character formed for eight years in the Catholic elementary school, and now, being fortified in the Catholic high school, could hardly fail to have some such result. We must not forget the power of unity either, when pupils, teachers, and parents all think alike about the great fundamental truths, all believe in the same principles of conduct, and all rely on the same means of grace.

So long, then, as co-education exists under these conditions, it can be based on a sound educational principle—namely, that the school should prepare students for normal situations to be met with in later life. Surely there is no situation more normal and more frequent throughout life than for men and women, when circumstances require it, to meet and talk and work together. To establish a similar situation in the high school, with the requisite safeguards, and to direct the boys and girls how to meet the situation in a normal way, may not be a necessity, but can be justified as an experiment. If, in addition to the advantages mentioned, it should prove to possess another—namely, a remedy for mixed marriages—then so much the better for co-education in Catholic high schools.

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MISSION STUDY IN OUR SCHOOLS

That mission science is a subject worthy of study and that it has a legitimate place among university courses is hardly open to question. Chairs of "Mission Science" exist in many Catholic universities in Europe, and the day is probably not far distant when similar chairs will be established in our principal centers of learning in this country. But that mission study has a place in our secondary, or even in our primary schools, and that it ought to be a part of their curriculum is probably a new idea to many. Yet I am venturing to assert that any Catholic school—primary, secondary, collegiate, or graduate—in which mission study is not carried on is not fulfilling the requirements of its foundation. Doubtless this statement, if not met with an expression of scorn, will be met with one indicating the hopelessness of trying to crowd into our already overburdened schedule one new thing. As I have already met that objection many times in suggesting the matter of missions to our school heads, I believe I can answer it here also.

As field secretary of the Catholic Students' Mission Crusade, I was constantly urging the formation of mission units in our schools. Founded to stimulate mission interest in our higher institutions, the Crusade soon discovered that it was beginning too late in the student's career and that for the best results our grade school children must be enlisted as well. Hence, at the General Convention held at Washington in 1920, the formation of "Junior Units" in such schools was authorized. That the idea was found practical is seen by the fact that on January 1, 1923, there were 678 such units in existence, with new ones affiliating daily. There will unquestionably be nearly, if not quite, 800 by the end of the present school session. These units are pledged to some missionary work, material, educational or spiritual, but not definitely to mission study as such, nor do the schools wherein they exist pledge themselves to its introduction. Mission study is a thing apart from mission societies, the observance of mission festivals, or contributing to missionary causes. The points

most necessary to stress are: first, that mission study does not mean an *addition* to our school curricula; and, secondly, that without it our religion courses are bound to be faulty and incomplete. If these can be shown to be true, then there can be no excuse for delay in its introduction. My purpose is to try to demonstrate their truth.

Taking up mission study in the way it should be done in grammar schools does not mean the introduction of "mission science" into the course, however valuable a preparation of that sort would be for the teacher. Ethnological problems, questions concerning the origin of pagan beliefs, matters dealing with the preparation of the missionary, are all obviously out of place. So is the study of the "mechanics" of mission propaganda, of staging mission festivals, and of the gathering of missionary statistics and information. The use of the school studies to stir up missionary enthusiasm is not, however, beside the point. Indeed, it is the thing. Every subject in the course can be brought to bear on mission study by a teacher who knows and loves missions. The application to geography is, naturally, the easiest to see. It livens the interest in strange lands to tell the pupils the struggles of the Church in those lands; it helps especially if some personal contact can be established with a priest or sister who is laboring there. Few students are so blasé as to be unmoved by letters from the field or pictures of actual missionary scenes. The connection with history is not difficult to see, either, for the privations of the pioneer missionaries make history; and no land, including our own, is without its share of those valiant apostles who have heard the call and heeded it. Their lives are always an inspiration. And stressing their work from its religious side is a much-needed corrective to the excessive secularism of our day. No one but knows of "Marquette, the explorer," few, even among Catholics realize that this character is entirely secondary to that of "Pere Marquette, S.J., missionary."

Arithmetic is made much more like a living subject if mission problems are presented for solution, than when it consists in the doing of examples involving a set of impossible values (for the present time) like buying so much "butter at \$.18 a

pound," or "cloth at \$.06¼ a yard." Once the children know some mission arithmetic a mite-box assumes a new significance. Even grammar, the bugbear of most young pupils, is made more interesting by well-chosen stories and illustrations of the difficulties encountered by those who are endeavoring to master the vernaculars of the mission field. And so we might pursue the matter through each subject of the course. Each one can be spiritualized and enlivened by mission interest.

We come, then, to our second contention, that it is in connection with our courses in religion that the greatest opportunity for mission study presents itself, and that these courses lack something without it. The Old Testament might conceivably be taught without the mention of missions, though the careful teacher will see in the *exclusion* of missionary enterprise among the chosen people of the Old Dispensation, an analogy of the time of preparation which must be endured nowadays by the young aspirants for the mission field. But how anyone can teach the New Testament without teaching missions is beyond my conception. Are not the Gospel narratives the relation of the Life of Him who "came to save sinners," "to seek that which is lost," and to preach the glad tidings to souls in "darkness and in the shadow of death?" The Acts of the Apostles is missionary history from start to finish, while the Epistles of St. Paul are, in large part, the letters of a missionary bishop to his converts. It would be an unimaginative teacher, indeed, who failed to see missions in them, and it would be a most abnormal child who would fail to respond to the inspiration given by his instructor.

The desirability of mission study is, I think, demonstrated. It will not overcrowd the curriculum but will act as a leavening power in every one of its present subjects, permeating them all, giving them an interest and a meaning never before felt. The only thing that remains is to show its feasibility, and this depends upon the equipment of the teacher. The present generation has not, for the most part, been trained in missionary knowledge. No courses are offered in our colleges for acquiring it, and, even if they were, many would feel they had no time to take them, since they were not immediately applicable to the work they would have to do. The informa-

tion must be brought to them in some other way, and that is one of the functions of the Catholic Students' Mission Crusade. The Crusade is a student organization, stresses student initiative, places the responsibility (in Senior Units) upon the students themselves, but its value to teachers is unlimited, and they can, if they will, learn much from it. Perusal of its literature, consultation with its "Unit Activities Bureau," and above all, where possible, attendance at its gatherings, will equip any teacher to introduce mission study into a school. The Fourth General Convention of the Crusade will be held August 9 to 12 this year at Notre Dame, Indiana, and a teacher's presence at that gathering will be as valuable in upbuilding that teacher's equipment as a session in a summer school.

We are not thorough Catholics unless missions are in the forefront of our Catholic education. Dearth of the mission spirit, lack of mission knowledge, no mission study on our part, are bearing their fruit in bigotry, prejudice, and open warfare against the Church. We may not be able to make up altogether for our past derelictions; we have no excuse for putting off any longer our plain duty.

FLOYD KEELER.

TEACHING ENGLISH COMPOSITION IN HIGH SCHOOL BY THE PROJECT METHOD

(Continued)

IV

How to adapt the project method to the teaching of English composition and how the successful teaching of English composition really requires some use of this mode of learning will appear from a brief consideration of what is today accepted as the soundest theory of composition-teaching,³⁰ considered from the three-fold viewpoint of aim, material, and method.

The general aim of the classroom activities in composition, as here outlined, is to develop in the pupil the power to express his individual experiences correctly, convincingly, and interestingly with a nearer and nearer approach to clear and logical thinking through clearer and more logical expression.³¹ This purpose, though broad in scope, narrows down in its realization to definite objectives for each pupil. Not the teaching of mere form and rules, but the systematic development of each pupil's powers, becomes the teacher's special task.³²

The specific aims prescribed, in this report, for each successive grade are too many for complete enumeration here, but none of them are out of harmony with the project idea and many of them plainly support it. In the eleventh grade, for instance, the first requirement is: "To give experience in collecting and organizing material for themes of some length—1,500 words or more; to teach the use of the expository outline for this purpose; to show how to secure interest and appropriate emphasis."³³ Here is undoubtedly a "unit of purposeful experience,"³⁴ a project. In an earlier part of the course, we read: "Pupils should learn how to handle typical problems of business correspondence near to ordinary experience; telegrams."³⁵ This suggests "problematic acts car-

³⁰Cf. "Reorganization of English in Secondary Schools," Bulletin 1917, No. 2, Washington, pp. 36-44 and 54-62.

³¹Cf. *Ibid.*, p. 54. ³²Cf. *Ibid.*, p. 54. ³³*Ibid.*, p. 60.

³⁴James F. Hosie, "Outline of the Problem-Project Method," *English Journal*, Vol. 7, November, 1918, p. 599.

³⁵"Reorganization of English in Secondary Schools," Bulletin 1917, No. 2, Washington, p. 59.

ried to completion in a natural setting,"³⁶ in other words, more projects. As a final specific aim we find this: "To utilize special interests for particular classes where conditions permit."³⁷ Here again is the suggestion that natural interests be capitalized and "purpose" enlisted for giving thought clear and personal expression; or, to be more concrete, the project is shown to be necessary to the effective teaching of English composition.

The emphasis put upon "individual treatment" in the preceding statement of the aims "requires that each pupil do much writing and speaking on subjects familiar to him."³⁸ His activities and experiences in school and out of school are the material of which his themes are made. Whatever touches his life, either actually or through his awakened interest, becomes a fruitful subject of his attempt at composition. His studies, amusements, reading, sports—all furnish the "natural setting"³⁹ or situation which the project requires.

The chief obligation, then, of the teacher of composition is to "meet the needs of the individual pupil"⁴⁰ by making them all theme work "as real and vital as possible."⁴¹ Life currents again supply both the material and the shaping force of self-expression; or, to put the matter more plainly, the project method, although not mentioned by name in the report, is clearly implied both in principle and in practice.

V

While the possibilities of the method have only begun to be discovered, various projects have already produced worthwhile results and these will be here discussed, not from the

³⁶John A. Stevenson, "The Project Method of Teaching," N. Y., 1921, p. 89.

³⁷"Reorganization of English in Secondary Schools," Bulletin 1917, No. 2, Washington, p. 61.

³⁸*Ibid.*, p. 54. Cf. B. F. Hinsdale, "Teaching the Language-Arts," N. Y., 1896, p. 118.

³⁹John A. Stevenson, "The Project Method of Teaching," N. Y., 1921, p. 89.

⁴⁰"Reorganization of English in Secondary Schools," Bulletin 1917, No. 2, Washington, p. 54.

⁴¹*Ibid.*, p. 56. Cf. S. S. Laurie, "Language and Linguistic Method," Edinburgh, 1899, p. 63.

viewpoint of pleasant theory but as successful practice personally observed.

(a) *Letter Writing*.—The progress made by a certain fifth grade in learning the mechanics as well as the spirit of this necessary form of composition, because they made the problem a real one by writing to real persons from whom they received replies, is typical of what happens also in high school.

The letter which actually functions in the pupil's life is far more effective than the dead assignment taken from a rhetoric text. A letter of inquiry, an order for books or class material, a note of condolence or thanks—these and similar occasions for individual and group projects, furnish ample and vital opportunity to each member of the class for acquiring this special knowledge and skill.

(b) *Use of Public Library*.—An investigation by the class of the various library facilities offered either in their own school or at the public library is a project producing a type of skill which will make all future work in English, both composition and reading, more economical from the viewpoint of time and more satisfying from the viewpoint of result. The remembrance of having seen, in the reading room of a large university library, even teachers of long experience taking down from the shelves one bound volume of magazines after another, in the hope of finding a desired article, suggests to the writer that this project is a real necessity.

If the class assignment be some person or event of current interest, magazine literature will be the chief source of theme material. A committee of two or three is instructed to look up Poole's Index and the Reader's Guide and to report their findings in the form of brief bibliographies to the class. This project is repeated from time to time until every member of the class has become familiar with the usefulness and economy of these references.

Again, the class visits the library and studies first-hand its many-sided opportunities. The card catalog, the reading room, the circulation department and the reference shelves offer resources for the immediate material of thought, for models of expression, and for independent activity in later life.

These two projects would be placed by Kilpatrick in the fourth group or type, which "includes experiences in which the purpose is to acquire some item or degree of knowledge or skill, or more generally, experiences in which a person purposes his own education at a specific point. The difference between this and other kinds of drill is again exactly one of attitude. Here the child purposes to learn the thing at hand, an attitude which makes a great difference in the efficiency of learning."⁴²

(c) *Reading Literary Masterpieces.*—Composition teaching depends, more than we sometimes realize, upon the work done in reading and literature. A love for the better books and a habit of reading them will serve composition in two ways: by stimulating to noble and interesting thoughts, which will seek an outlet in oral or written form; and by furnishing models for study, imitation, and invention. The introduction of reading-projects into the pupil's direct training in the use of the mother-tongue is strongly urged by Franklin Bobbitt in his discussion of the curriculum. "The first educational task," he insists, "is to provide each child and youth with a rich and full language—life of the type desired. Let him live abundantly in the rich fields of reading experience with language of desired types flowing through his consciousness and unconsciously moulding vocabulary, sentence-forms, and language thought-structures."⁴³ Literary wholes, however, rather than literary fragments, should be made the basis of this experience. The present tendency is, indeed, to recognize in literary masterpieces "the best examples of great thought units, of knowledge rightly organized and artistically grouped."⁴⁴ Consequently, the aim in these reading projects is to lead pupils to experience for themselves, not only the unity of theme and impression in these literary productions, but also the organic development and growth of the theme through almost infinite varieties of thought and form.⁴⁵ Any

⁴²William H. Kilpatrick, "Dangers and Difficulties of the Project Method and How to Overcome Them," *Teachers College Record*, Vol. xxii, No. 4, September, 1921, pp. 285-286.

⁴³Franklin Bobbitt, "The Curriculum," Boston, 1918, pp. 249-250. Cf. Carpenter, Baker, and Scott, "The Teaching of English," N. Y., 1919, p. 235.

⁴⁴Charles A. McCurry, "Teaching by Projects," N. Y., 1920, p. 10.

⁴⁵Cf. Percival Chubb, "The Teaching of English," N. Y., 1912, p. 102.

literary work, then, read in class or out of class with this end in mind, becomes a project of the second type, defined by Kilpatrick as "one which involves purposeful enjoying or appropriation of an experience."⁴⁶

(d) *School-home Reading*.—In the senior literature class this year, the reading of books outside of assignments studied in class was made a school-home project. The bibliographies at the end of each chapter and the literary works⁴⁷ mentioned in the text were suggested as a guide to the reading of complete literary works, which were representative either of their type or of the literary period during which they were produced. Reports were given in class and written accounts submitted to the teacher. An increased interest in books and authors, a discriminating taste in their selection, and higher standards in the pupil's own attempts at composition were the most evident results of this reading project.

The following typical lists taken from the notebooks of three different students, represent in each case the supplementary reading done by them during a six weeks' period:

No. 1.—Ballads

- "The Twa Sisters."
- "The Cruel Brother."
- "Babylon: Or the Bonnie Banks of Fordie."
- "The Wife of Usher's Well."
- "Hind Horn."
- "Sir Patrick Spens."
- "The Wee, Wee Man."
- "Robin Hood Rescues the Widow's Three Sons."
- "The Nutbrown Mayde."
- "Thomas Rymer."
- "Katharine Jeffray."
- "The Ballad of the Oysterman."—Holmes.
- "The Well of St. Keyne."—Southey.
- "The Battle of Agincourt."—Drayton.
- "The Revenge."—Tennyson.
- "The Wreck of the Hesperus."—Longfellow.

⁴⁶William H. Kilpatrick, "Dangers and Difficulties of the Project Method and How to Overcome Them," *Teachers College Record*, Vol. xxii, No. 4, September, 1921, p. 284.

⁴⁷Cf. Rev. William F. Cunningham, C.S.C., "How Is a Liberal Education Acquired?" *America*, Vol. xxvii, No. 8, June 10, 1922. Cf. Samuel Thurber, *School Review*, Vol. 1, p. 652.

No. 2.—The Elizabethan Age

- "Of Studies."—Bacon.
 "The Faerie Queene."—Spenser.
 "As You Like It."—Shakespeare.
 "Twelfth Night."—Shakespeare.
 "Measure for Measure."—Shakespeare.
 "Cymbeline."—Shakespeare.
 "Song to Celia."—Jonson.
 "Triumph of Charis."—Jonson.
 "Drake."—Noyes.

No. 3.—American Literature

- "The Alhambra."—Irving.
 "Rip Van Winkle."—Irving.
 "To a Waterfowl."—Bryant.
 "Thanatopsis."—Bryant.
 "The Prairie."—Bryant.
 "The Raven."—Poe.
 "Janice Meredith."—Ford.
 "The Hoosier Schoolmaster."—Eggleston.
 "To Have and To Hold."—Johnston.
 "Ramona."—Jackson.
 "Alice of Old Vincennes."—Thompson.
 "Red Rock."—Page.

(c) *Class Debate*.—A debate⁶⁸ in which all the members of the class take part is an effective means of teaching how to gather and organize the material for composition. The necessity of coming to a definite conclusion about a question arising either from a class lesson or from some other school activity will motivate the collecting of information from every available source. Personal observation, reading, and interviews with well-informed persons will all be made to contribute to the pupil's present knowledge of the question under discussion. The final weighing of point against point while the pupils as a group work toward a logical arrangement of propositions which are tenable serves not only as a means of clarifying and developing thought, but as a vital occasion for its expression.

(f) *Summarizing Paragraphs*.—The class debate, just described, and the paragraph summarizing which will be touched upon in this section, illustrate Kilpatrick's third type of

⁶⁸Cf. H. G. Lull and H. B. Wilson, "The Redirection of High School Instruction," Philadelphia, 1921, pp. 148-149. Cf. John M. Bremer, "Oral English," Boston, 1916, pp. 25-44 and pp. 225-289.

project "in which the dominating purpose is to solve a problem."⁴⁹ These two projects further suggest that the purpose of composition-teaching is to help the pupil directly to thought control and to facility of self-expression in all subjects of study; they make clear, too, that composition is not a separate branch of the curriculum, nor even, in the strict sense, a distinct part of the English course, since "intellectual entanglements"⁵⁰ calling for solution and for adequate expression are to be found in every kind of mental activity.

The "obscure perplexities"⁵¹ mentioned by Boraas in his "Teaching to Think" confront the average pupil in almost every assignment of the day. Even when the diction of a passage or chapter, marked for study, is within his understanding, surprising difficulties appear when he attempts to reduce the main thought of each paragraph to a single sentence. And yet this process furnishes the clearest possible proof that the pupil has grasped the author's idea, that he has straightened out the author's entanglements of thought and expression and has arrived at a satisfactory solution.

Definiteness of thought on the part of the pupil will result also from a reversal of the process, that is, having the pupil summarize his theme, even a short one, before he attempts to write it. Burgess Johnson⁵² suggests that these summaries take the form of captions, the writing of which will force the pupil to set definite limits to his composition and to select for its development interesting and significant facts. In the longer theme, instead of general headings, an outline, composed of topic sentences arranged in the order in which they are to be treated, will tend to help clear up the pupil's "apparent uncertainty as to just exactly what he is writing about."⁵³

SISTER M. CATHERINE.

(To be continued)

⁴⁹William H. Kilpatrick, "Dangers and Difficulties of the Project Method and How to Overcome Them," *Teachers College Record*, Vol. xii, No. 4, September, 1921, p. 285.

⁵⁰*Ibid.*, p. 285. Cf. Carpenter, Baker, and Scott, "The Teaching of English," N. Y., 1919, p. 230.

⁵¹Julius Boraas, "Teaching to Think," N. Y., 1922, p. 136.

⁵²Cf. Burgess Johnson, "The Well of English, and the Bucket," Boston, 1917, p. 66. Cf. Percival Chubb, "The Teaching of English," N. Y., 1912, p. 190.

⁵³Burgess Johnson, "The Well of English, and the Bucket," Boston, 1917, p. 65.

EDUCATION IN NOVA SCOTIA BEFORE 1811

(Continued)

No complete list of the Capuchin laborers in Acadia during this period has come down to us. The names of twenty-three clergymen and nine lay-brothers survive. Some of them perished in the discharge of their duties in the colony; others were obliged to leave from sheer destitution and still others were banished from the country when it changed owners.³⁸

France remained in titular possession of Acadia for half a century after the dismemberment of the Port Royal school, but there is no evidence that the missionaries attempted its reestablishment. Port Royal, as the metropolis of population, was the logical situation for a school; but its security was thereafter fraught with so much uncertainty that it is probable the missionaries did not deem it wise or expedient to repeat the venture.

In 1713, France definitely relinquished her claims to Acadia, the interest of the French priests being confined thereafter chiefly to the discharge of their religious functions amongst the French inhabitants and the Indians. Their purpose, however, made necessary the continuation of catechumenal instruction in church doctrine and observances of the Christian life. While this phase of their work yields the most striking aspect of their educational efforts in the years that followed, there is reason to believe, as has already been shown, that they were not altogether unmindful of the secular educational needs of their flocks. As the missionaries at this time were invariably capable of conversing in the Indian tongue, they could teach the articles of faith to the savages simply and effectively.

The Ordre de Bon Temps.—Before disposing of the period of French ascendancy in the peninsula of Nova Scotia, mention should be made of an institution that at an early date performed service of a literary and educational character for the people at Port Royal. This was the ancient society of

³⁸Lenhart, Rev. John, *op. cit.*, Vol. 28, No. 1, March, 1917, p. 47 *et seq.*

the "Ordre de Bon Temps," organized by the clever Marc Lescarbot.

Lescarbot came to Acadia in the train of Poutrincourt in the spring of 1606. He had been a lawyer by profession but, conceiving law a useless and even base calling, he neglected his legal duties to pursue studies in literature. At Port Royal he took assiduously to horticulture, and when not engaged in the field, spent his time in retired study or in devising means of diversion for the long evenings. In his little room he had a few books brought from France and there, in his retreat, he wrote his diary and composed poems, some of which were afterwards printed under the title "*Muses de la Nouvelle France*."³⁹

The Ordre included fifteen of the principal men of the place among whom were several possessing literary talent. Periodic meetings were held in the dining-hall of M. Poutrincourt's house, each member of the club assuming, in regular succession, the office of Grand Master of the proceedings. A feast or banquet marked the opening of the meeting, this being followed by rounds of sharp discussion in which featured witty jokes, songs and the recital of verses, usually composed by Lescarbot himself.⁴⁰ These meetings were always attended by twenty or thirty savages, men, women, girls and boys. In this way the natives became accustomed to the ways of the white man and learned something of his language.⁴¹ The recreation was no less of educational benefit to the French inhabitants themselves, helping, as it did, in that remote little settlement to keep the spark of learning alive.

Lescarbot, in a more direct way also, became a sort of pedagogue to his compatriots. "I am not ashamed to confess," he writes, "that at the request of our chief, M. de Poutrincourt, I devoted some hours each Sunday to the religious instruction of our men, both in order to improve their minds and to offer an example to the Indians of our manner of living."⁴² He took great delight in observing the customs of the Indians, and he was wisely able to say to the missionaries, "It will be the part

³⁹Lescarbot, Marc. *The History of New France*, Vol. 1, Intro., p. xlii.

⁴⁰*Ibid.*, Intro., Vol. 1; *Canada and Its Provinces*, Vol. 13, p. 30.

⁴¹Lescarbot, Marc, *op. cit.*, Vol. 11, p. 343.

⁴²*Ibid.*, Vol. 1, Intro., p. xlii.

of prudence in the pastors to teach them carefully and not in fantastical ways."⁴³

This admonition lends additional weight to the view already expressed, that the French missionaries in Acadia discharged duties that might very properly be termed pedagogical. No doubt, they did considerable religious teaching. Before receiving the postulant Indians within the Church, it was necessary to subject them to a process of instruction, necessarily brief but sufficient for communion. Occasionally, throughout the documents, instances are given descriptive of the ceremonies incident to the confession of faith by the natives. Referring to the conversion of the Micmac chief, Membertou, with a score of his kinsmen in 1610, Lescarbot writes: "After the necessary instruction had been given, on St. John Baptist's Day, June 24, 1610, they were baptised to the number of 21."⁴⁴ Instruction of this kind was continued by the French priests in Nova Scotia long after it had ceased to be a French province.

The Notre Dame School at Louisbourg.—A serious effort to establish a school in Isle Royale (Cape Breton) was made by the French after the peace of 1713. Having by that treaty renounced all right to the peninsula, France determined to make Isle Royale the metropolis of French population in Eastern Canada with the principal establishment at Louisbourg. The town had about 500 inhabitants in 1715 out of a total for the entire island of 720; 963 in 1726 and 1,463 in 1737, when the estimate for the whole of Cape Breton was in the vicinity of 3,800.⁴⁵ This field had already at an early date been explored by Catholic missionaries.

By a charter granted to the Ecclesiastics of the Episcopal Seminary of Foreign Missions at Quebec by Richard Dennis on the 13th of August, 1685, the former were authorized to establish a church or chapel on Cape Breton with the privilege of enjoying certain land concessions. One stipulation was that the Seminary settle thereon a resident priest "for the purpose of preaching the Gospel and to instruct in the Faith and Roman Catholic Apostolic Religion all the said

⁴³*Ibid.*, Vol. 2, p. 180.

⁴⁴*Ibid.*, Vol. 3, p. 37.

⁴⁵McLennan, J. S., *Louisbourg from its Foundation to its Fall, 1713-1758*, London, McMillan and Company, 1918, p. 371.

Indian aborigines and others who might join them."⁴⁶ This humble beginning received further impulse by the application of the settlement policy of 1714 in which education received more detailed consideration than formerly. With the establishment of the town at Louisbourg teachers now became necessary and, after a period of vacillation, choice for the work fell on the Notre Dame Sisters of Montreal. The order had been founded by Marguerite Bourgeois in 1659 and already had attained distinction in scholastic work.

Replying to a request for teachers by M. De St. Ovide, Governor of Cape Breton, the Bishop of Quebec suggested, in 1726, that a branch of the Notre Dame house be established at Louisbourg. The proposal, though accepted by the Governor, met with disapproval on presentation to the French Government.⁴⁷ By letters patent granted in 1716, a number of Sisters of Charity were established in the town and brothers of the same order were about the same time put in charge of the hospital.⁴⁸ The home government deemed the services of these sufficient to meet the needs of the garrison. But the Bishop of Quebec, in a communication addressed to the French Foreign Minister soon afterwards, expressed the belief that the religious orders stationed at Louisbourg were not competent to meet the many demands the situation imposed on them.⁴⁹ Incident to the Bishop's exhortation, the field was opened to the Notre Dame Sisters in 1730 and an allowance of 1,500 livres granted them by the King of France.⁵⁰ Two years later Sister Marguerite le Roi came to Louisbourg, followed next year by three more sisters with Sister St. Joseph as superior.⁵¹

On the 8th of August, 1733, the Sisters purchased a house for 15,000 livres from Sieur et Dame Beaucour in which they opened a school.⁵² Their first pupils were orphan and destitute children. As facilities for accommodation began to improve they took in, for instruction, children of officers of the

⁴⁶*Public Records of Nova Scotia*, Vol. 2.

⁴⁷*Reports on the Canadian Archives*, 1904, p. 79.

⁴⁸*Ibid.*, 1887, pp. ccxviii; ccxxxviii.

⁴⁹*Ibid.*, 1887, p. ccxvii.

⁵⁰*Ibid.*

⁵¹*Ibid.*, 1904, p. 184.

⁵²*Public Records of Nova Scotia*, Vol. 4.

garrison.⁵³ Later on they received young women of the town as resident pupils.⁵⁴ For this latter purpose Governor Forant subsequently made them a grant of 1,600 livres per year.⁵⁵ This same gentleman, recognizing the meritorious character of their work, bequeathed them, at death, the whole of his property.⁵⁶ His will, however, was contested by his sister and but a portion of it fell to the institution.⁵⁷

Governor Forant's endowment provided for the education of six young women of the town. As to the total number of pupils in attendance, no figures are available, but communications that passed between the Sisters and the Vicar de l'Isle Dieu show that it was so great as to overtax accommodations. Frequent requests were made by the Sisters for alleviation of the situation. In 1733 the Comptroller, M. Sabatier, reported to the French Minister that the orphans had been placed with the Sisters and requested that some provision be made for their subsistence.⁵⁸ They requested a charter of establishment in 1736, but this was refused. Three years later, however, it was granted along with a yearly gratuity of 1,500 livres and a special donation of 3,000 livres more in compensation for the expense of establishment in 1733.⁵⁹

During the siege of 1744 the nunnery suffered severely from the bombardment; and after the fortress fell the Sisters were removed to France with the civilian population.⁶⁰ Disembarking at Rochefort, they made their way to La Rochelle where they took refuge in l'Hospital de St. Etienne.⁶¹ On restoration of Cape Breton to France by the treaty of 1748, the Sisters were asked to resume their teaching at Louisbourg, the Intendant stating that "it appears very desirable that these dear Sisters return."⁶² After an absence of almost

⁵³*Reports on the Canadian Archives*, 1887, p. cccxiv.

⁵⁴*Public Records of Nova Scotia*, Vol. 4.

⁵⁵*Ibid.*

⁵⁶*Reports on the Canadian Archives*, 1899, p. 244.

⁵⁷*Ibid.*, 1904, pp. 292-293.

Mention is made in the documents of the Sisters of Notre Dame being at Louisbourg as early as 1727. See *Reports on Can. Archives*, 1887, p. ccciii.

⁵⁸*Ibid.*, 1887, p. cccxiv.

⁵⁹*Ibid.*, 1904, pp. 267, 268.

⁶⁰Chauveau, Pierre, *L'Instruction Publique au Canada*, Quebec, p. 171.

⁶¹*Public Records of Nova Scotia*, Vol. 4.

⁶²*Ibid.*

four years they found their home, on arrival, in a most dilapidated condition and altogether unfit for occupation.⁶³ Their request, that the government of the colony put it in a fit state of repair, seems to have been ignored; for they were driven to the necessity, eventually, of renting new quarters at an annual cost of 500 livres. The new location was very inadequate to the Sisters' purpose, and we find them, as a consequence, confining their attention thereafter to the preparation of young girls for first communion. The number of these was also restricted to thirty. The Sisters reported that frequent protests were made by others who sought admission but who were refused because there was no place to put them.⁶⁴ Another source of annoyance to the Sisters was occasioned by the recall, in 1743, of their yearly allowance of 1,500 livres. In a letter dated for the year 1751, they reiterated these statements relative to their condition and stated moreover their embarrassment at trying to provide suitable quarters for the young women of M. De Forant's foundation.

It would appear that in time the Sisters succeeded in their efforts to command the interest of the authorities for when Louisbourg was taken in 1758 their property consisted of a building of fairly large dimensions situated near the center of the town.⁶⁵

The Sisters were probably among the last of the French inhabitants to leave Louisbourg after the capitulation of 1758. They were still there when Pichon wrote in 1760.⁶⁶ In 1768, however, Governor Franklin, writing to the Board of Trade, reported that the nunnery was in a state of ruin.⁶⁷ The last we hear of it is in the records of 1772 when Richard Bulkeley advised George Cottnam, Chief Magistrate at Louisbourg, to permit Lawrence Kavanagh to "occupy and convert to his own use the remaining part of the frame of a house at Louisbourg known by the name of the nunnery."⁶⁸

⁶³*Ibid.*

⁶⁴*Public Records of Nova Scotia*, Vol. 4.

⁶⁵*Ibid.*, Vol. 43, Doc. 53, Plan of the Town of Louisbourg.

⁶⁶Pichon, Thomas, *Genuine Letters and Memoirs* . . . p. 203.

⁶⁷*Public Records of Nova Scotia*, vol. 43, Doc. 53.

⁶⁸*Ibid.*, Vol. 136, p. 156.

For location of the nunnery at Louisbourg, consult Gridley's Map, 1745; a copy is contained in *Reports on the Canadian Archives*, 1886, p. ciii.

With the demolition of the nunnery at Louisbourg the last material trace of educational achievement in Acadia by the French disappeared. Race rivalry and intolerance had accomplished for the school at Louisbourg what individual cupidity had achieved for the Port Royal seminaries over one hundred years before. The life history of those schools was short, and the warlike circumstances under which they persevered distracted their peaceful pursuits and threatened momentarily their very existence. But during this brief period of endurance they did more to educate and Christianize the Indians than the new domination accomplished in many years. They were educational pioneers in Acadia; the seminaries at Port Royal realizing a success denied their contemporaries at Quebec. The Capuchins in Acadia, as Lenhart notes, "had solved the problem in which Laval had failed; they had put little French boys on the benches with the savages . . . This was a success which neither the Jesuits nor the Sulpitians had accomplished."⁶⁹

The capitulation of Acadia to the English changed the aspect of French education in the country forever after. In sequestered and remote parts of Nova Scotia communities of French families lingered long after the edict of ostracism had been enacted against them. Removed from educational influences and deprived of the services of their priests, they remained in comparative illiteracy. They seemed, indeed, to have lost the educational sense and their descendants, though numerous in certain sections of the province, remained, for long, rather outside the pale of educational interest. One reason for this undoubtedly is that the dominating language of instruction in their community schools has been foreign to their native vernacular.

Though, natural to such condition, their language lost its original purity, intrinsically through illiteracy and incidentally because of surroundings, they, nevertheless, have retained that characteristic ideal of religious devotion instilled in them by the early missionaries. They constitute at the present day a most promising element in the population of the province.

PATRICK WILFRID THIBEAU.

(To be continued)

⁶⁹Lenhart, *Rev. John*, *op. cit.*, Vol. 27, No. 3, September, 1916, p. 224.

THE CLASSICAL SECTION

The editor of this section earnestly solicits queries regarding any phase of classical studies. He will endeavor to answer all such questions personally, giving special notice in these columns to whatever he regards as of sufficient general interest. A word from you regarding your solution of any of the many problems concerned with the teaching of the classics will also be gratefully received and will here be placed with due credit at the disposal of our Catholic teachers.

Just what is ecclesiastical Latin? As popularly understood ecclesiastical Latin is the language of the Mass, and the Latin used as a medium of conversation in ecclesiastical gatherings. To a philologist, however, ecclesiastical Latin is that period in the life of the language which chronologically is roughly covered by the first five centuries of our era. It appears in the literature of the early Christians, although the writers need not be priests of the Church, but may even be heretics.

The component parts of ecclesiastical Latin may be defined as follows:

I. The colloquial language. Colloquial Latin is the language of ordinary conversation, which existed as a living thing, while the language of literature drew itself more and more away from it, developing into the highly artificial and crystallized form of literary Latin.

II. The Scriptures. In refuting their opponents, the Latin Fathers sought arguments from the Bible. Thus the Semitic and Greek idioms in which the Latin Bible abounds must have, in spite of conscious efforts in opposition, influenced their thought and writings.

III. Classical Latin. Classical Latin as taught in the schools of rhetoric which nearly all the Fathers attended, almost unconsciously adorns the style of ecclesiastical Latin.

IV. Tertullian. This independent type of mind, full of originality, exerted a special influence of its own on ecclesiastical Latin.

It has been said that in general there abounds in ecclesiastical Latin a simplicity of style, an absence of artificiality, a naivety of structure, a carelessness of grammatical rules, but a positive effort toward directness and ready intelligibility.

Unfortunately no grammar of ecclesiastical Latin as yet exists. In fact the time is not yet ripe for the writing of such a work. Much more remains to be done on the individual works of the great Christian writers of the first five centuries, before a comprehensive work including the results of these monographs can be accomplished.

About a year ago there appeared from the Cambridge University Press "An Introduction to Ecclesiastical Latin" by Rev. H. P. V. Nunn, M.A. The author of this work, however, used a very small portion of the information available to him in the special monographs written thus far. In the progress of his work, the author has failed to distinguish carefully between the classical and the ecclesiastical. Thus as an introduction to ecclesiastical Latin, this book leaves much to be desired.

About fifty pages at the end of this volume are given over to "Extracts from Ecclesiastical Writers," which are very well selected. In the great dearth of school texts of ecclesiastical Latin, this work may be found very useful for class-room purposes.

One of the most common complaints of the Latin teacher is that his students know no English grammar. Indeed it has become a fundamental principle for the teacher of Latin to take no knowledge of English for granted in explaining some new phase of Latin grammar. "Make sure that your class knows first the English idiom" is the constant caution. The situation has become such that it is generally expected that the child shall really learn his formal English grammar in the Latin class, and, while for a time Latin teachers objected to this additional burden, more and more they are welcoming it as an opportunity of rendering another service to education.

This work depends on the teacher himself having a very clearly defined system of formal Latin grammar; in spite of a certain prevailing tendency to drift away from things formal

and to deal with the natural. Aside from the work of pure memory, i.e., the drill in forms, this aspect of Latin teaching applies to syntax, and consists in memorizing a certain minimum of syntactical terms which are to be constantly applied to the text. Too often does a teacher say, "What difference does it make what kind of a genitive the student calls it, provided he can translate it properly?" It makes little difference whether or not a pupil can quote the exact rule of the grammar defining the genitive, but it makes a vast deal of difference whether or not he can name the particular genitive and give an intelligent explanation of it. If he cannot do so, his translation, if correct, is accidentally so, and he can never develop into an intelligent and accurate interpreter of the Latin language.

A great portion of the formal side of grammar is passed over even in the Latin, and consequently also in the English, and a great opportunity for stimulating thought is thereby lost. How often may not a certain genitive be considered to have several different applications, and what an encouragement to the pupil, when he has decided on an explanation which he is allowed to keep as being possible even though the teacher prefers another! Formal grammar so taught, with a view to inducing the student to work out his own interpretation, becomes very flexible and human.

The use of the "pony," the "Caesar Fully Parsed," etc., is a complete demoralizer of this phase of Latin teaching. In the hands of the pupil, it changes the study of syntax from a means of developing thinking power to an exercise of the memory on things in themselves not worth memorizing. Then Latin necessarily becomes uninteresting and tiresome. A worse situation still arises when the teacher considers it helpful to make use of such "helps." He is liable to find himself gradually using them as guides, and he soon fears to think independently of them, until he ceases to think at all and is consequently unable to make his pupils think.

The following question was asked recently in the *Classical Journal*: "Is it better to allow a student to finish an incorrect translation and thus permit all the class to hear his

mistakes and require a correct translation, or stop him at each mistake and correct it, then to require the correct translation?"

Professor Ullman answered most effectively as follows:

"My own feeling is that generally speaking a student ought to be allowed to finish a translation even if it is incorrect. I feel rather strongly about this as a general rule. There are exceptions, of course. Perhaps in a class with many poor students exception might be made, but even then I should prefer to call on each student for so short an assignment that he could get through without making too many mistakes. I sometimes make an exception in the case of a good student, who makes a slight mistake or mispronounces a proper name which I quickly correct before allowing him to go on. To stop a pupil constantly may have the effect of making him nervous and of disturbing the class as well."

In the present investigation of the American Classical League, many problems have arisen the solution of which has brought out a wide difference of opinion. All concerned, however, are looking to the same end, an adjustment that will bring the maximum of benefit to the cause of the Classics in School and College, but the great question is how this is to be achieved.

Professor H. C. Nutting in a recent number of the *Classical Weekly* has summed up the divergence of opinions under two heads somewhat as follows:

A. One program is marked by the following features:

1. An attempt to bring Latin into line with the pernicious and narrow educational theory of the day by surrendering mastery of the language as an aim, substituting therefore certain "direct training" that looks in other directions.
2. Overtures to out-and-out enemies of real Latin, who might tolerate the name if the actual work were centered upon derivation, and the like.
3. Sacrificing the gifted students and depriving them of the training they ought to have, in order to provide something more "practical" that will appeal to the majority.

B. The other program may be summed up as follows:

1. An uncompromising attack upon the educational fads and fallacies of the day, and a refusal to yield in any way to them.

2. A demand that a safe and sure place be reserved in the school curriculum for the standard subjects. If schools can bear the cost of "acceleration" classes and the like, they can bear the expense of keeping open the opportunity for the kind of training the best students need.

3. Without sacrificing the best students, to give every child the fullest value possible for the time he spends on the study of Latin.

In the November number of the *REVIEW* attention was called to the inaugural volume of "The Catholic University of America Patristic Studies," and at the same time optimism was expressed in the future growth of the series. It is with real pride that we announce the following volumes of the series as in the press and ready for distribution from the University Library by the end of the coming month of June.

Vol. II. The Influence of the Second Sophistic on the Style of the Sermons of St. Basil the Great, by J. M. Campbell.

Vol. III. The Vocabulary and Rhetoric of the Letters of St. Augustine, by Sister Wilfrid, S.N.D.

Vol. IV. The Syntax of the *De Civitate Dei* of St. Augustine, by Sister Mary Columkille, C.L.I.V.

Mention should also be made of another work, not of the Patristic Studies but a product of post-graduate study in Greek at the University, which will appear at the same time: *The Form of the Ancient Greek Letter*, a study in Greek epistolography, by F. X. Exler, O. Praem.

The courses in Latin announced for the Summer School are Latin II, which will deal with Caesar's Gallic Wars and is designed especially for those who followed Latin I last summer; Latin VIII, which treats of the *Aeneid*; and Latin XIX, which gives a general survey of Latin poetry through lectures

and the translation of representative specimens. Latin XIX will pay special attention to selections of Ovid's *Metamorphoses*.

The courses in Greek are Greek III, dealing with Xenophon's *Anabasis* and open to anyone who has covered the material of a First Year Book; and Advanced Greek dealing with such work as best suits the demands of the class.

ROY J. DEFERRARI.

EDUCATIONAL NOTES

SUMMER SESSIONS AT SISTERS COLLEGE

The following courses will be offered at the Summer Session, 1923:

<i>Course</i>	<i>Professor</i>	<i>Hour</i>
Philosophy of Education II...	Dr. Johnson.....	8 A.M.
Psychology of Education II...	Fr. Geary.....	9 A.M.
History of Education IV.....	Dr. McCormick.....	10 A.M.
School Administration I.....	Mr. Monahan.....	8 A.M.
High School Methods.....	Dr. Johnson.....	9 A.M.
Primary Methods II.....	Dr. Pace.....	11 A.M.
Primary Reading.....	Sr. Alma.....	12 M.
Methods in History.....	Dr. Purcell.....	12 M.
Educational Sociology.....	Dr. Cooper.....	4 P.M.
Educational Measurements...	Dr. Moore.....	4 P.M.
Introduction to Philosophy I.	Dr. Ryan.....	9 A.M.
Logic.....	Dr. Ryan.....	10 A.M.
Genetic Psychology III.....	Dr. Pace.....	9 A.M.
General Psychology II.....	Dr. Moore.....	5 P.M.
Mathematics I.....	Dr. Ramler.....	8 A.M.
Mathematics II.....	Dr. Ramler.....	10 A.M.
Mathematics IV.....	Dr. Rice.....	9 A.M.
Mathematics V.....	Dr. Rice.....	11 A.M.
Physics III.....	Mr. Burda.....	3 P.M.
Physics IV.....	Mr. Burda.....	4 P.M.
Chemistry I.....	Dr. Chambliss.....	3 P.M.
Chemistry II.....	Dr. Chambliss.....	4 P.M.
Biology I.....	Dr. Parker.....	10 A.M.
Biology IV.....	Dr. Parker.....	11 A.M.
*Biology II.....	Mr. Dardinski.....	4 P.M.
*Biology V.....	Mr. Dardinski.....	2 P.M.
Biology VII.....	Mr. Brilmyer.....	2 P.M.
†Biology VIII.....	Mr. Brilmyer.....	3 P.M.
English XV.....	Dr. Lennox.....	11 A.M.
English XVII.....	Dr. Lennox.....	12 M.
English V.....	Mr. Hartnett.....	9 A.M.
English VII.....	Mr. Hartnett.....	10 A.M.
Latin II.....	Dr. McGourty.....	8 A.M.
Latin VII.....	Dr. McGourty.....	10 A.M.
Latin XVIII.....	Dr. Deferrari.....	9 A.M.
Greek III.....	Dr. Deferrari.....	10 A.M.
Greek VII.....	Dr. Deferrari.....	12 M.

* Laboratory limited to 24. Students received in order of application.

† Laboratory limited to 10.

<i>Course</i>	<i>Professor</i>	<i>Hour</i>
French I.....	Mr. Schneider.....	8 A.M.
French V.....	Mr. Schneider.....	10 A.M.
German I.....	Mr. Behrendt.....	8 A.M.
German VI.....	Mr. Behrendt.....	9 A.M.
Spanish I.....	Mr. Coutinho.....	9 A.M.
Spanish IV.....	Mr. Coutinho.....	11 A.M.
American History I.....	Dr. Purcell.....	11 A.M.
Church History V.....	Dr. Browne.....	11 A.M.
General History VI.....	Dr. Weber.....	10 A.M.
Art I.....	Sr. Mary of Angels...	2 P.M.
Art II.....	Sr. Mary of Angels...	3 P.M.
Art III.....	Mr. Murphy.....	9 A.M.
Art IV.....	Mr. Murphy.....	10 A.M.
Music I		
Music II		
Music III		
Music IV		
Music V.....	Mr. Boyce.....	4 P.M.
Music VI		
Music VII.....	Mr. Boyce.....	5 P.M.
Music IX.....	Miss Henneman.....	Arranged
Music X.....	Miss Henneman.....	Arranged
Music XI.....	Miss Henneman.....	Arranged
Music XII.....	Miss Henneman.....	Arranged
Music XIII.....	Miss Henneman.....	Arranged
Music XIV.....	Miss Henneman.....	Arranged
Music XV.....	Miss Henneman.....	Arranged
Music XVI.....	Miss Henneman.....	Arranged
Music XVII.....	Miss Henneman.....	Arranged
Music XVIII.....	Miss Henneman.....	Arranged
Music XIX.....	Miss Henneman.....	Arranged
Music XX.....	Miss Henneman.....	Arranged
Music XXI.....	Miss Henneman.....	Arranged
Music XXII.....	Miss Henneman.....	Arranged
Music XXIII.....	Miss Henneman.....	Arranged
Music XXIV.....	Miss Henneman.....	Arranged
Music XXV.....	Mr. Henneman.....	9 A.M.
Music XXVI.....	Mr. Henneman.....	10 A.M.
Music XXVIII.....	Mr. Henneman.....	11 A.M.
Music XXIX.....	Miss Henneman.....	Arranged
Music XXX.....	Miss Henneman.....	Arranged
Music XXXI.....	Miss Henneman.....	Arranged
Music XXXII.....	Miss Henneman.....	Arranged
Music XXXV.....	Mr. Henneman.....	12 M.
Business Arithmetic.....	Mr. Deviny.....	3 P.M.
Commercial High School.....	Mr. Deviny.....	4 P.M.

THE VALUE OF WRITTEN EXAMINATIONS

That the Standard Tests have not eliminated the traditional examination and that there are values in the written examination that the newer instruments cannot yield, is implied in the following statements, the first from President Lowell of Harvard, and the second from the Bureau of Educational Research of the University of Illinois. Says President Lowell:

First, there is the disciplinary examination whose object is mainly to ascertain whether the work required of pupils has been faithfully done. Since in our common schools oral teaching has to a great extent replaced individual study by the pupil of prescribed lessons in a textbook, the need of constant examinations of this type has been felt less than formerly. It would seem to be against examinations of this kind, the most common and best understood type, that the repugnance of the teachers is mainly directed.

A second kind of examination may be termed informational, its object being to discover the extent and accuracy of knowledge possessed by the person examined. Of this nature are the examinations for admission to college by those institutions that still employ them—now almost entirely conducted by the College Entrance Examination Board. Into the same class fall also, for the most part, although by no means wholly, the examinations held at the end of college courses. Such examinations are valuable only in measuring knowledge which the person who takes them ought to possess. In a college course where the same ground has been covered by all the members of the class the questions can easily be made both fair and searching. But where precisely the same ground has not been covered, or has not been covered with equal thoroughness in all parts, such examinations lose much of their value and precision; and school teachers sometimes complain that even in an elementary subject the varying stress laid on its different parts makes the questions prepared by a stranger in some degree an unfair test of the proficiency of the pupil.

The third kind of examination may, for want of a better word, be called potential, its aim being to measure the power or capacity to use and correlate knowledge. The object is not so much to find out what facts the student knows, but how far he has grasped their meaning, how fully he can apply them, how far his studies have formed a part of his being and developed the texture of his mind; in short, not whether he has been duly subjected to a process, but what as a result of it he has become. This type of examination, while employed

regularly for the doctorate of philosophy in universities, has not hitherto been used systematically in our colleges. Oral examinations, from their greater flexibility, have certain distinct advantages for this purpose, but they are by no means necessary. The psychological tests that have recently come into vogue are attempts to measure intelligence, that is, to disclose the capacity of the persons to whom they are applied; and useful as they are so far as they go, they deal only with very elementary information. We are seeking for examinations that will measure the acquired ability to use specialized knowledge on a far higher plane. This the general examination undertakes to do, and in doing so it must strive to measure, not merely what has been included in formal courses, but the subject as a whole, because the object to be attained is fixing the student's attention on the subject, not on those portions of it that happened to be included in any course or series of courses.

The reasons for the general examination have been stated more than once in these reports, but experience in its use has now continued long enough to say something about its results. Counting more than once those who failed and tried again, we have now examined 1,009 students in this way. Certainly a number sufficiently large to justify drawing some reliable conclusions; and in fact during the single year covered by this report, the first in which the general examinations were in use for subjects other than history, government, and economics, 424 students were so examined, a number that will not be less in the years to come.

The examination is a real additional requirement for graduation, because the students who fail to pass it lose their degrees although they have passed all the seventeen courses which are still required and which until the general examination was established were alone required. It is interesting, therefore, to note the number of failures. In the division of history, government, and economics, during the seven years it has been in use, there have been 773 men examined, of whom fifty-nine or 7.6 per cent have failed. A man who fails is allowed two more attempts at subsequent examinations if he so desires, without being obliged to reside in Cambridge; and, in fact, of the fifty-nine who failed, nineteen have tried again, fifteen of them with success. Of the sixteen who failed for the first time in 1922 it is probable that some will present themselves another time. In other subjects, to which the general examination was applied for the first time in 1922, there were 236 candidates of whom sixteen or 6.8 per cent failed. Naturally the proportion of failures varied considerably in the different subjects. In English, which is not deemed by the

students very difficult, and where the number of candidates was much the largest, being 125, the failures were thirteen, or more than one in ten. These figures show that the requirement of a command of the subject as a whole, beyond what is obtained from taking courses of instruction, is effective.

A second exhaustive discussion of examinations is presented in a bulletin published by the Bureau of Educational Research of the University of Illinois under the title *Written Examinations and Their Improvement*.

Probably the most prominent function of the written examination is that it provides an opportunity for learning, both in the preparation for the examination and in the actual writing of it. The pupil who is not required to take examinations is missing an important part of his educational opportunities. The importance of this function, however, varies with the type of examination. Examinations which call merely for facts or in which the pupil is not required to formulate an answer consisting of several sentences offer only a limited educational opportunity. Incidentally it may be noted that this is one weakness of the "new examination."

A second function of written examinations is the measurement of the achievements of pupils. As we have pointed out, measurements are essential to the organization and administration of schools as well as to class-room instruction, and examinations do secure a type of information relative to the achievements of pupils which can be secured in no other way. Although written examinations possess these functions it should be remembered that it is only when examinations are properly used and not abused that the fulfillment of these functions may be expected.

The written examination furnishes an effective motive. It is true that some criticisms may be offered against the use of the examination to motivate the work of the school, but this use, unless carried to an extreme, is probably not harmful. . . .

Teachers should give more attention to the formulation of examination questions. Relatively unimportant topics or those which have not received emphasis during the term should be omitted. Ambiguous statements should be avoided. The questions also should be varied so that they demand different types of mental ability, memory, reasoning, organization, etc. Pupils should be given directions concerning methods of work. . . .

A systematic procedure should be followed in marking the examination papers. Explicit rules should be formulated relative to the effect of misspelling, poor English, poor handwriting.

ing, and so forth, upon the "grade" assigned to a paper. The rule should cover also credit for correct principle and partial credit for answers partially right. The "sorting method" of marking is recommended. . . .

The "new examination" has many advantages, among which are its increased objectivity of marking and the economy of time for both pupils and teachers. The "new examination" will undoubtedly prove useful, but its limitations must not be overlooked.

Traditional examinations call for the functioning of distinct types of mental ability not demanded to so great a degree in any other kind of school work, and should not, especially in the case of final examinations, be abolished, nor replaced entirely by any other form of school exercise. Teachers and pupils, more and more, should be impressed with their unique educational value.

DR. ELIOT ON PRESENT NEEDS IN EDUCATION

The drastic criticism of the American schools, contained in the current report of the Carnegie Foundation, has awakened a general discussion of the problem of modern education. The following statement of President Eliot is worthy of note. It appeared in the *New York Times*.

The greatest educational need of the United States today is, in my opinion, the adoption of the following program and discipline in schools and families:

Enlist the interest of every pupil in every school in his daily tasks in order to get from him hard, persistent, and enjoyed work.

Cultivate every hour in every child the power to see and describe accurately.

Make the training of the senses a prime object every day.

Teach every child to draw, model, sing, or play a musical instrument and read music.

Make every pupil active, not passive; alert, not dawdling; led or piloted, not driven, and always learning the value of co-operative discipline.

Teach groups of subjects together in their natural relations; for example, arithmetic, algebra, and geometry, or history, biography, geography, and travel. Associate reading, spelling, and English composition and secure practice in them every day. Teach chemistry, physics, biology, and geology together every week throughout the twelve-year course.

Put into all American schools universal physical training for both boys and girls from six to eighteen years of age.

Make sure that every pupil has a fair chance to learn the elements of agriculture, dietetics, cooking, and hygiene, every boy the elements of some manual trade, and every girl the domestic arts. The instruction in hygiene should include the defenses of society against the diseases and degradations consequent upon ignorance, moral depravity, poverty, and vice.

To make room for the new subjects and for increased instruction addressed to the individual pupil, reduce class work and the size of classes, lengthen the school day, and shorten the summer vacation. Use in classes such stimulating competition as both children and adults use in sports and games.

Keep the atmosphere of every school and family charged with the master sentiments of love, hope, and duty. Keep out both fear and selfishness.

There is no doubt that such schools will cost much more money in buildings, grounds, salaries, and equipment than the American communities have been accustomed to spend. Therefore, appropriations of public money and private gifts for endowments must both be increased.

What some people call frills or fads in schools and family life, like music and drawing, are really of fundamental importance. The variety of studies offered by the new program is essential to the discovery by every pupil of the kind of work he likes best, and the variety of elective studies in high schools and colleges is indispensable to the development of American scholarship and to the general attainment of joy in work. A human life without joy in work cannot be a happy one.

The continued success of the American democracy in government, industries, and social organization depends on the adoption of these principles in the bringing up of children, the management of industries, and the use of leisure.

EDUCATIONAL PERIODICALS

Catholic School Journal (March): Sister M. Louise, Ph.D., discusses Our Savior as "The Model in Education." A Sister of Charity suggests six criteria by which to measure a recitation. They are, Complete Response, Attention to Subject Matter, Readiness to Reply, Eliminating Distractions, Maintaining High Standards, Good Expression. Father Garesche contributes a practical article on what is always an important subject, "Helping Vocations for Teaching." Sister Mary Katherine, O.S.B., reports some results of the Otis Intelligence Tests, Advanced Form A, given to two hundred high school students of Duluth, Minn.

Catholic School Interests (March): This issue is the Special School Design and Construction Number and includes such interesting material as "Fundamentals in School House Planning," "Sanitation Ventilation and Heating of School Buildings," "The Importance of Artificial Lighting in Schools," "Schools without Fire Hazards," "The Planning of Science Laboratories." "Statistics and the High School Curriculum," by Rev. T. J. Murray, C.M., presents evidence that some change is necessary in the traditional high school course, if a large percentage of the pupils is to be benefited. The Rev. John A. O'Brien, Ph.D., discusses the significance of eye movements in reading. Hugh Graham, M.A., writes of "The Place of Mathematics in a Liberal Education."

American School Board Journal (April): The superintendent will find much food for thought in an article by William Seneca Sutton on "Some Obsessions in the Realm of School Administration." Fred C. Ayer reports in detail the results of a questionnaire sent out to a group of city school superintendents for the purpose of determining "The Present Status of Promotional Plans in City Schools." At present there are thirty-six promotional plans in vogue in various parts of the country, which is an evidence of the efforts that are being made to adapt the system to the needs of different types of children. In a number of dioceses at the present time, something along the line of a budget system is being considered as a means of properly financing Catholic education. For all who are interested in this phase of the work, there is suggestion in an article by Arthur B. Moehlman on "The City School Budget." Superintendent Longanecker, of Racine, Wis., tells about three Junior High Schools in that city. The article is factual and is well illustrated. Gertrude Jones presents a practical scheme of "Internal Accounting in High Schools."

Education (April): Articles of special interest are, "Educative Discipline," by Henry Armand Geisert; "The Juvenile Delinquent," by Helen M. Casey; "A Special Program for Intellectually Superior Children," by Ira A. Flinner; "Vocational Guidance as Part of the High School Program," by William F. Linehan.

Educational Review (April): Lorne W. Barclay makes a

plea for better coordination between the school and the Boy Scout Movement. Robert Morris Ogden sketches a "Curriculum for the College of Arts," based on the assumption that "in order to maintain 'a place in the sun,' the college of arts and sciences must provide a course of study calculated to furnish general enlightenment; a background and a perspective with which life and experience can be measurably enriched." That there is need for extended investigation and analysis that we may determine what are the minimum essentials and the best methods of procedure, is the burden of George E. Jones' article, "What is Physical Education?" Henry Neumann contributes a thoughtful article on "Science Teaching: Ethical Values and Limitations." "Project Tangentials," by William C. Ruediger, is a keen analysis of the place and limitation of the project method and represents what will prove to be the sane educator's ultimate appraisal of this much discussed device.

The Elementary School Journal (April): "Dual Administrative Control in City School Systems—A Case Study of Its Origin and Development," by Harry N. Irwin, is the first installment of a study of the Cleveland system, where the board of education appoints two administrative officers, the Director of Schools, who acts as a business manager, and the Superintendent of Schools, who is the educational, or instructional manager. Such a plan might recommend itself in some of our larger dioceses, where the superintendent at the present time finds himself immersed in so much administrative detail, that he finds little time for supervision of instruction. Orville G. Brim discusses "The Curriculum Problem in the Rural Elementary Schools." M. Elizabeth James suggests ways and means of using the classroom library as a means of stimulating interest and speed in reading. The article contains lists of readings for the various grades. C. T. Gray discusses "The Anticipation of Meaning as a Factor in Reading Ability."

The English Journal (April): Articles worthy of note are: "Aims and Standards in Public Speaking Work," by James A. Winans; "Content of Seventh and Eighth Grade Readers," by M. E. Herriott; "The Briggs Form Test in Use," by C. C.

Certain; "Material for High School Literature," by Jane A. Hilson and Katherine E. Wheeling. Percy H. Boynton continues his notes on contemporary authors, discussing James Branch Cabell.

The School Review (April): Emery N. Ferris offers some very objective suggestions as to "Curriculum Building in the Rural High School." Grace T. Lewis tells how the Mt. Vernon, New York, High School is trying to aid its graduates in obtaining increased educational opportunities. The school cooperates in the raising of funds for this purpose. Peter Spencer suggests the making of "home made," non-standard tests of a diagnostic type as a means of improving teaching. High-school principals will find suggestion in the article by Evan E. Evans on "What To Do with the High School Assembly." P. H. Pearson gives an interesting account of current educational practices in Europe.

G. J.

REVIEWS AND NOTICES

General and Professional Biology, by Edward J. Menge, Ph.D., Marquette University. Milwaukee, Wis.: The Bruce Publishing Co. Price, \$6.50, net.

The purpose of the author in preparing this work may be gleaned from a reading of the preface wherein he states that "all that is needed for two complete years of biological work is contained within this one volume, each part logically following the part preceding, thus not only saving the student considerable time and expense, but also serving him as a sort of continual reference work in his future professional years of study. . . . The book is so written that it can be used as a text for General Biology, General Zoology, for Introductory Embryology and for Comparative Anatomy."

From the above quotations it will be seen at once that the author has essayed a formidable task. That he has labored seriously at the same cannot be doubted; but whether he has, as he implies, and as some of his reviewers seem to think, solved all the difficulties that confront college teachers and students of biology is open to question.

In the first place, the volume, despite its artistic make-up, is unwieldy, containing nearly 1,000 pages, which will militate against its use as a text-book. Moreover, we doubt the wisdom of endeavoring to crowd into a single book all the information that a student should get in any particular course. Such an attempt can have but one result, the production of a compendium; and that, in our opinion, is what Dr. Menge has given us, a compendium of biological knowledge. Covering in broad outlines the whole field of the science, profusely illustrated and containing a splendid index-glossary, it partakes of the nature of an encyclopedia of biology. As such it is well worthy of our attention and will be a useful addition to the library of every student of the subject. The treatment of many of the topics is all that could be desired. The author's discussion of the question of evolution is particularly worthy of notice. He gives us a candid presentation of the arguments for and against the theory with no dogmatic

declaration in favor of either side, pointing out the fact that there is not as yet sufficient evidence to permit of our drawing a definite conclusion. His summary of the criteria necessary for arriving at a satisfactory theory of evolution is remarkably concise and complete.

However, according to our way of thinking, the book in its present form is not suited for use in the classroom. In justification of his plan of treatment the author says: "If a student must seek through many volumes for references he is all too apt not to look for any at all, whereas, if he has but to turn a few pages, he will almost invariably search out many." Such a statement wants proof; but even if it were true it would hardly confirm the author's position. Have we not been told somewhere to "beware of the man of one book?" Shall we, therefore, encourage the college student to limit his reading in biology to one author? Shall we rest satisfied if he actually does so? Or shall we not rather insist on his consulting references and teach him how to do so?

Apart from this general objection to the wide scope of the book, we are not impressed with the author's arrangement of topics in the first section, viz., General Biology. In the first place, the introductory chapters, entitled "Why to Study," "How to Study," and "The Coordination of Subjects Studied," are as much out of place here as they would be in a work on chemistry and physics and should have been omitted. As for the discussion of the subject proper, it is difficult to tell what plan the author had in mind. The arrangement does not meet the requirements of a course on Type Forms or on General Principles, though he seems to think that it will satisfy both. Moreover, some teachers will not be satisfied with the small amount of space (44 pages) given to plant biology and many are bound to find fault with some of the types chosen for study. *Sphagnum*, for example, is not always easy to obtain and many prefer *Polytrichum* for the study of the general characters of the mosses.

Some of the chapters bear evidence of haste in preparation or of lack of care in correcting. That on the crayfish, for example, contains several incorrect statements which are inexcusable in a work of this kind. We mention only a few of

those we have noted. "The maxillae lie anterior to the mandible" (p. 313). "These glands act similarly to lungs" (p. 319). "The paired genital openings are on the base of the first abdominal appendage" (p. 323). Similar mistakes are not lacking elsewhere in the book, and there is a goodly share of misspelled words and grammatical errors.

In the section devoted to embryology we find a similar lack of scientific exactness. Few authorities will agree with the author's account of the sequence of events in the development of the embryo. Most of them hold, for example, that maturation occurs before ovulation. Many of the illustrations in this section are far from satisfactory, especially those that have been redrawn or modified from other authors. Some, which are evidently the work of students, are positively inaccurate.

Without entering further into the discussion of this work we may say that in our opinion it should be reissued in three volumes, the various sections having first been carefully revised. This would give us three separate manuals, each of which would make a volume of respectable size that would be adapted for the work of the classroom. The three might be made to sell for the price of the present volume.

EDWARD B. JORDAN.

Books Received

Educational

Boynton, Percy H., "American Literature," a Textbook for Secondary Schools. Boston: Ginn and Co., 1923, pp. 462. Price, \$1.60.

Carpenter, Frank G., "Carpenter's New Geographical Reader, Asia." New York: American Book Co., 1923, pp. 479.

Chapman, R. W., Johnson, Prose and Poetry, with Boswell's Character, Macauley's Life and Raleigh's Essay. New York: Oxford University Press, American Branch, 1923, pp. 195. Price, \$1.20.

Goodridge, G. W. F. R., "French Composition for Middle Forms." New York: Oxford University Press, American Branch, 1923, pp. 94. Price, \$1.00.

Halleck, Reuben Post, "History of Our Country for Higher Grades." New York: American Book Co., 1923, pp. 534 + xxxviii.

Hayes, Carlton J. H., and Moon, Parker Thomas, "Modern History." New York: Macmillan, 1923, pp. 890.

Miller, Edwin L., "Burns' Life and Poems." Philadelphia: Lippincott, 1923, pp. 131. Price, 60 cents.

Sanford, Frederick, Warren and Scott, Harry Fletcher, "A Junior Latin Reader." Chicago: Scott, Foresman, 1923, pp. 416-77.

Scott, Harry Fletcher, "First Latin Lessons." Chicago: Scott, Foresman, 1923, pp. 304.

Smith, David Eugene, "Essentials of Plane Geometry." Boston: Ginn and Co., 1923, pp. 296. Price, \$1.24.

Spinning, James M., "Boswell's Life of Samuel Johnson." Philadelphia: Lippincott, 1923, pp. 265. Price, 60 cents.

S. M. G., "Our Nation's Builders," A Catholic Textbook in American History for Grades 5 and 6. Chicago: Benj. H. Sanborn Co., 1923, pp. 370.

Smith, Homer G., "English for Boys and Men." Boston: Ginn and Co., 1923, pp. 330. Price, \$1.40.

Tanner, William M., "Composition and Rhetoric." Boston: Ginn and Co., 1923, pp. 500+xxxviii.

General

Ayrinac, Very Rev. H. A., "General Legislation in the New Code of Canon Law." New York: Blase Benzinger and Co., 1923, pp. 384. Price, \$3.20 postpaid.

Brewster, G. W., "Common Sense of the Calculus." New York: Oxford University Press, American Branch, 1923, pp. 62. Price, 70 cents.

Dolphin, Rev. Oliver, "The Secrets of the Religious Life." New York: Macmillan, 1923, pp. 80.

Labache, Rev. L., S.S., "The Three Sacraments of Initiation." New York: Blase Benzinger and Co., 1923, pp. 500. Price, \$2.50.

Lane, H. H., "Evolution and Christian Faith." Princeton: Princeton University Press, 1923, pp. 211. Price, \$2.00.

Loyola, Mother Mary, "King of the Golden City" (School Edition). New York: P. J. Kenedy and Sons, 1923, pp. 90. Price, 50 cents.

Paula, Sister Marie, "Psychology and the Dramatic Art." New York: William H. Sadlier, 1923, pp. 149.

Smith, Judith F., "In Our Lady's Library." New York: Longmans, Green and Co., 1923, pp. 152. Price, \$1.50.